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ABSTRACT

The Parents as Teachers (PAT) program is increasingly turned to as an option in broadening parent education and family support program offerings. In order to provide evidence of PAT's effectiveness in general and with low-income families in particular, a public-private partnership was formed to conduct a multi-site evaluation in three communities. Participating in the evaluation were 667 families with infants up to 8 months of age. Families in each community were randomly assigned to a participant or control group. The participant group was offered monthly home visits and other PAT services for as long as the families chose to remain in the program. The control group received only the services normally available in the site community. Annual child assessments were conducted at or around the children's birthdays. Findings indicated that only minority status and poor maternal health were significant challenges to participant engagement. The most consistent positive program effects were for parenting behaviors, as measured by the Home Observation for Measurement of the Environment Scale, and for measures of parent-child interactions. Very-low-income parents experienced somewhat greater benefits than their more-moderate-income counterparts. Site differences in parent outcomes were substantial. Developmental benefits to 2-year-olds participating in PAT were quite weak. It was concluded that practitioners should have modest expectations for the impact of home visiting programs on parents and children. (A description of the evaluation methods is appended. Contains 61 references.) (KB)

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SRI International

June 2001

MULTISITE PARENTS AS TEACHERS EVALUATION

EXPERIENCES AND OUTCOMES FOR CHILDREN AND FAMILIES

SRI Project P07283

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A. Brenno
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Prepared by:

Mary Wagner
Donna Spiker

With:
Frances Hernandez
Julia Song
Suzanne Gerlach-Downie

PS 029727

SRI International, 333 Ravenswood Avenue, Menlo Park, California 94025

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CONTENTS

Acknowledgments v

Executive Summary vii

1 Introduction 1
- Design Overview 2
- An Overview of the PAT Program 3
- Local PAT Programs in the Evaluation 4
- A Conceptual Model of the Multisite Evaluation 5
- Evaluation Questions and Expectations 6

2 Individual and Household Characteristics 9
- Characteristics of Families at Enrollment 9
  - Maternal Demographics 10
  - Household Characteristics 11
  - Maternal and Child Health 13
  - Experience with and Knowledge of Infants 14
  - Child Care Use 15
  - Summary 16
- Participant and Control Group Equivalence at Enrollment 16
- Changing Family Circumstances 22
  - Individual and Household Characteristics 22
  - Maternal and Child Health 27
  - Information-Seeking Behavior 27
  - Children's Activities 29
- Summary 29

3 PAT Program Participation 33
- Recruiting Families 34
- Duration of Participation 36
- Amount and Intensity of Services 40
- Who Engaged in Home Visits? 47
  - Demographic Characteristics 47
  - Potential Barriers to Engagement 47
- Summary 52

CONTENTS (concluded)

4 Parenting Outcomes 55
Knowledge of Child Development and Parenting 56
Attitudes toward Parenting 58
Parenting Behaviors 64
Summary 76

5 Child Outcomes 81
Child Development 81
Children's Health Care 83
Summary 87

6 Does Level of Participation Make a Difference? 89
Multivariate Analysis Results 90
"High-Dose" Comparison 90
Summary 95

7 Conclusions 97

References 101

Appendix: Evaluation Methods 105
Design Overview 105
Sample Development and Maintenance 106
Data Collection Instruments 108
Data Collection Procedures 112
Participation in and Timing of Assessments 115
Data Analysis Approaches 118

FIGURE

Figure 1-1 Conceptual Framework of the Multisite Evaluation 6

TABLES

Table 2-1 Demographic Characteristics at Enrollment, by Site 10
Table 2-2 Household Characteristics at Enrollment, by Site 12
Table 2-3 Maternal and Child Health at Enrollment, by Site 14
Table 2-4 Mother's Previous Experience with Infants, and Information Seeking at Enrollment 15
Table 2-5 Child Care Use at Enrollment, by Site 16
Table 2-6 Group Equivalence in Mothers' Demographic Characteristics at Enrollment, by Site 18
Table 2-7 Group Equivalence in Household Characteristics over Time, by Site 19
Table 2-8 Group Equivalence in Maternal and Child Health over Time, by Site 20
Table 2-9 Group Equivalence in Parents' Information Seeking over Time, by Site 21
Table 2-10 Group Equivalence in Child Care Use over Time, by Site 23
Table 2-11 Changing Individual and Household Circumstances, by Site 24
Table 2-12 Maternal and Child Health over Time, by Site 28
Table 2-13 Changing Information-Seeking Behavior, by Site 28
Table 2-14 Activities of 2-Year-Olds, by Site 30

Table 3-1 Recruitment Sources of Participant Group Families, by Site 35
Table 3-2 Participation Status of Participant Group Families, by Site 36
Table 3-3 Reasons for Participant Group Families' Dropping Out of PAT 37
Table 3-4 Months Participating, by Participation Status 39
Table 3-5 Home Visit Participation, by Participation Status 41
Table 3-6 Referrals to Outside Agencies Made During Home Visits 44
Table 3-7 Engagement during Home Visits, by Participation Status and Site 45
Table 3-8 Dimensions of Engagement in Home Visits, by Demographic Characteristics at Enrollment 48
Table 3-9 Dimensions of Engagement in Home Visits, by Potential Barriers to Participation 50
Table 3-10 Impacts of Individual and Household Characteristics on Participation and Engagement 51

TABLES (concluded)

Table 4-1	Parent Knowledge Impacts	57
Table 4-2	Parent Knowledge Impacts, by Income Level	58
Table 4-3	Parent Knowledge Impacts, by Site	59
Table 4-4	Parent Attitude Impacts	60
Table 4-5	Parent Attitude Impacts, by Income Level	62
Table 4-6	Parent Attitude Impacts, by Site	63
Table 4-7	Impacts on Parents' Observation of Their Children	65
Table 4-8	Parents' Language- and Literacy-Promoting Behaviors	66
Table 4-9	Language- and Literacy-Promoting Behaviors, by Income Level	68
Table 4-10	Language/Literacy/Numeracy-Promoting Behaviors, by Site	69
Table 4-11	Parenting Behavior Impacts Measured by the HOME Scale	70
Table 4-12	Parenting Behavior Impacts Measured by the HOME Scale, by Income Level	72
Table 4-13	Parenting Behavior Impacts Measured by the HOME Scale, by Site	73
Table 4-14	Impacts on Parent-Child Interactions	75
Table 4-15	Summary of PAT Program Impacts on Parents at Second Assessments	77
Table 5-1	Children's Development at Second Birthdays, by Income Level	82
Table 5-2	Children's Development at Second Birthdays, by Site	84
Table 5-3	Children's Health Care at Second Birthdays, by Income Level	85
Table 5-4	Children's Health Care at Second Birthdays, by Site	86
Table 6-1	Significance of Relationship between Number of Home Visits and Parent and Child Outcomes for Participant Group Families	91
Table 6-2	Characteristics of "High-Dose" Participants and Adjusted Control Group	93
Table 6-3	Summary of PAT Program Impacts at 2-Year-Old Assessment for Those with Expected Level of Home Visits	94
Table A-1	Data Collector Speculation on Group Assignment of Families, by Child's Age	115
Table A-2	Number and Percentage of Enrolled Families Assessed, by Site	117
Table A-3	Stability in Group Membership Across Assessments	118
Table A-4	Age of Children at In-Home Assessments	120

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EXECUTIVE SUMMARY

Dramatic developments in technology and research in the last several years have created a new, wide spread awareness of the importance of children's early years in setting them on a positive developmental trajectory. Reflecting the value placed on early childhood intervention, there is a growing interest in providing programs that help families support positive child development. The Parents as Teachers (PAT) program is increasingly turned to as an option in broadening parent education and family support program offerings. PAT encourages positive child development among families with children who are less than school age through parenting education and developmental screenings that are provided by trained parent educators in regular home visits and through group meetings that reinforce the parenting information and provide social support.

To respond to the need for strong evidence of PAT's effectiveness in general and with low-income families in particular, the Office of Educational Research and Improvement of the U.S. Department of Education, the Smith Richardson Foundation, and the Robert Wood Johnson Foundation have formed a public-private partnership to support a multisite evaluation of PAT.* SRI International, in cooperation with the Parents as Teachers National Center, is conducting the Multisite Evaluation of the PAT program in three communities around the country. Participating local programs are in three geographically dispersed urban communities and are large enough to recruit the substantial number of new families needed for the evaluation, characteristics not typical of the majority of PAT programs. Across the three sites, 667 families with infants up to 8 months of age were recruited for the evaluation.

An experimental design has been employed for the evaluation. Families in each community were randomly assigned to a participant group or a control group so that the groups would be essentially equal at the outset; differences in outcomes then can be attributed with reasonable confidence to participation in the PAT program. By comparing participants in PAT with a control group, we can determine whether PAT was more effective in helping parents and children achieve positive outcomes than the community services that families might engage in on their own. The participant group were offered monthly home visits and other PAT services for as long as they chose to remain in the program.† The control group received only the services that normally were available in their community and that they sought at their own initiative. Both groups received annual child assessments at or around children's birthdays.

The evaluation has involved rigorous quantitative measurement of several dimensions of parent and child outcomes, using data collected through in-home assessments conducted by "field evaluators" unaffiliated with participating programs. Outcomes of participant and control group members are compared for the demonstration overall, for low- and more-moderate-income

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* The Carnegie Corporation of New York provided support for the design of the evaluation.

† Although PAT families typically are served until children are at least age 3, and the evaluation was planned to continue that long, only in Site 1 will the evaluation continue through assessment at children's third birthdays. Largely because of difficulties in engaging and retaining families in both the program and the evaluation, funders of activities in Sites 2 and 3 decided to discontinue the evaluation after the second assessment. Findings measured at children's third birthdays will be reported for Site 1 later in 2001.

families, and in each community so that the potentially important effects of community context and program differences can be identified. In addition, we have explored the extent to which the effect of the program varied with the level of families' participation.

Specifically, we address the following evaluation questions:

- **Enrollment.** Who enrolled in the Parents as Teachers program? What were the characteristics of the mothers and children in PAT families, and how did they change over time?
- **Attrition.** How well did the program retain the families it enrolled?
- **Services provided.** What levels of service did PAT families experience, and how engaged were they in those services? Were some kinds of families more active or engaged than others?
- **Parent outcomes.** What impacts did PAT have on parents' knowledge and attitudes and on their behavior toward and interactions with their children? What were outcomes for low-income families?
- **Child outcomes.** What impacts did PAT have on children's development and health? What were outcomes for low-income children?
- **Effects of program variations.** How did variations in families' experience of PAT, particularly the level of participation, relate to variations in their outcomes?

Family Characteristics

The characteristics of the families served in the PAT program provide a crucial context for understanding the participation and outcomes those families achieve. It is clear that the PAT evaluation communities were successful in recruiting diverse families, including a sizable proportion of families who were at risk due to low income, teen parents, single parents, and other factors. For example, almost 60% of households reported incomes of less than $15,000 per year; 80% reported incomes of less than $25,000. Almost one in five families reported receiving TANF benefits, and 63% participated in Medicaid. More than one in four families had teen mothers, and more than one-third of mothers had not graduated from high school; 54% were single. Overall, 29% of enrolled mothers were Caucasian and 58% were African-American. Families with mothers of other ethnicities were 12% of those recruited, most of whom (9%) were Hispanic.

The three evaluation communities differed significantly in the characteristics of the families they recruited. For example, Site 1 included a substantially greater percentage of teen parents than other communities. Consistent with this difference, mothers there were significantly more likely than others still to be enrolled in high school, to live in three-generation families, and to have only one child. Site 1 also had a significantly larger proportion of mothers who were Caucasian, who rated their home environment very positively, and who reported that their health and their children's health were excellent. Site 2 mothers were significantly less likely than

others to have very low incomes, but were significantly more likely to be in multiple-child families as the only parent present.

We also explored the circumstances of families at the times they were assessed to understand factors that may have influenced their participation in the program up to that point or the outcomes we measured. For example, about one-fourth of assessed mothers of 2-year-olds were pregnant again at the time of the assessment or had had another child in the preceding year. The percentage of households with two married parents increased relative to the time of enrollment among the groups assessed at both children's first and second birthdays. In addition, household incomes improved steadily over time. For example, at enrollment, 57% of the participant group families had incomes of less than $15,000; this percentage declined to 47% at the first assessment and 36% among those participating in the second assessment.

However, these changes did not affect communities equally. For example, the percentage of families in Site 2 in the lowest income category did not decrease over time as it did in other communities; similarly, the percentage of families with incomes greater than $40,000 was largely unchanged there. Site 1 mothers were more likely to have had another child during the evaluation than other mothers, consistent with the fact that the site had a higher proportion of first-time mothers at enrollment, who were more likely than others to have another child. These differences provide important context for understanding community differences in family participation and in parent and child outcomes.

Program Participation

Issues surrounding program recruitment, engagement, and retention are central to the effectiveness of home visiting programs. Parenting behavior and child development are unlikely to improve through involvement with a home visiting program if families drop out early, do not receive the level of service that is expected to make a difference, or are not truly engaged with the program's information or activities. Yet, traditionally, home visiting programs, as well as other social service programs, have had difficulty with just these issues.

The evaluation assessed the pattern of engagement of Multisite Evaluation participant group families through children's second birthdays. Analyses underscore the difficulties of engaging parents in home visiting programs, difficulties that may have been exacerbated by the requirement of the evaluation that a large number of new families be recruited. This required programs in at least two communities to undertake new recruitment procedures in new locations, which, they reported, resulted in recruiting families with less motivation to participate actively than would have resulted from their normal recruitment activities.

Among families enrolled in the PAT programs in the evaluation, 22% never began home visits, and 35% discontinued their participation before children were 2 years old. Being difficult to contact or no longer interested was the reported reason for two-thirds of the families leaving the program early. Overall, 44% of enrolled families were still receiving home visits at children's second birthdays. Families who began home visits averaged about 14 months of participation, during which they received an average of 9.5 home visits, or a ratio of home visits to months of participation of .52, about half the monthly visits attempted to be provided by the PAT programs. For every 10 visits delivered, 4 scheduled visits were cancelled or parents failed to be home at the appointed time. Forty-four percent of families received a referral to an outside

agency during their participation in the program. Parent educators rated families' engagement in home visits quite positively, giving them an average score of more than 5 on a 7-point scale; higher scores were given for passive engagement, such as listening to the parent educator, than to more active forms of involvement, such as asking for advice. Not surprisingly, families who persisted in the program through children's second birthdays received somewhat more home visits, more intense service, and more referrals than did dropouts.

Engagement challenges were not experienced by sites equally. Site 1 families consistently demonstrated significantly higher participation and engagement than families in other communities, perhaps partially because recruitment processes there most closely mirrored the normal recruitment activities, relative to other communities.

In addressing the question of who participated most actively, a variety of related factors were associated with differences in engagement (e.g., mother's age, education, and marital status; household income; etc.). However, when the interrelationships were controlled in statistical analyses, only minority status and poor maternal health were found to be significant challenges to engagement, independent of other factors in the analyses. Of particular interest is the lack of relationship between some assumed barriers to participation and engagement measures. In focus groups, parent educators reported that activities like having a job and going to school were significant barriers to engagement, as was a general instability or "chaos" in the home. However, none of these factors were significantly related to engagement when other characteristics of parents were controlled for in multivariate analyses.

Parenting Outcomes

The evaluation has examined the impact of PAT on parents' knowledge of child development and parenting, attitudes toward parenting, and parenting behaviors in several domains. For each outcome measure, we compared the participant and control groups at assessments conducted near children's first and second birthdays. Effect sizes are presented, which express the difference between groups as a proportion of the standard deviation of the combined groups.*

For participants as a whole, there was a pattern of generally small positive effects on measures that represent each of the three parent outcome domains assessed: parenting knowledge, attitudes, and behaviors. Of 25 parent outcome measures assessed, 12 showed positive effects, including 2 that were moderate in size; no negative effects were noted.

The most consistent positive effects were noted for parenting behaviors, measured by the Home Observation for Measurement of the Environment (HOME) scale, and for measures of parent-child interactions. The measure of overall parenting knowledge also showed a small effect, reflecting effects on knowledge of general child development and children's emotional development. The one parent attitude impact that was detected was a moderate positive, statistically significant effect on parents' reports of being happy when caring for their children.

Very-low-income parents experienced somewhat greater benefits than their more-moderate-income counterparts. Of 25 parent outcome measures, very-low-income parents showed positive effects on 13, with effects being moderate in size for 5 of the outcomes. In comparison, more-

* For the kinds of outcomes measured in the evaluation, an effect of .10 to .30 is considered small, .31 to .50 is considered moderate, and more than .50 is considered large.

moderate-income parents demonstrated positive effects on 10 measures, with 3 being moderate to large and 2 of those being statistically significant. All gains in parenting knowledge were concentrated among very-low-income parents; most were moderate in size. Very-low-income parents also exhibited small benefits on attitudes that are precursors of child maltreatment. In contrast, more-moderate-income parents showed more-consistent benefits regarding parenting behaviors, showing benefits on 9 of 14 behavior measures, compared with 7 for very-low-income parents. However, the benefits to very-low-income families, where they occurred, may be particularly important in light of the fact that their scores were lower than those of less-poor families on several of the outcome measures, suggesting that PAT could help close some of the gap between income groups in some aspects of parenting knowledge, attitudes, and behaviors.

Site differences also were substantial. The strongest and most consistent pattern of benefits was apparent for participants in Site 2, who showed positive effects on 17 of 25 parenting outcome measures, including 11 that were moderate or large in size, 5 of which were statistically significant. Particularly strong and consistent benefits were noted in Site 2 regarding parenting behaviors, with 13 of 14 measures showing positive effects, 10 of them moderate or large and 4 of them statistically significant. On many measures, scores for families in Site 2 were lower than those for the sample as a whole, offering some support for the notion that PAT may benefit most those who have most to gain in parenting knowledge, attitudes, and behaviors.

Child Outcomes

Developmental benefits to 2-year-olds participating in PAT in the Multisite Evaluation communities were quite weak for the sample overall. Small positive effects were noted only on a measure of social adjustment. Health care use impacts were somewhat stronger, with small positive effects on being fully immunized for their age and reduced needs for treatment for injury and emergency room care. Children from very-low-income families benefited slightly more than others on developmental measures, whereas those from more-moderate-income families had somewhat greater effects on the measure of immunization. Site differences in children's development were more pronounced, favoring Site 2, where there were moderate positive effects on two measures of social adjustment and small positive effects on measures of self-help and communication development. However, children there did not fare better than others on health-related measures.

It is quite possible that children in the Multisite Evaluation communities did not demonstrate more consistent or positive benefits because they were assessed as 2-year-olds rather than at age 3, when they would have completed the core PAT program. In addition, a substantial proportion of participant group families whose children were assessed did not actually receive home visits, a fact that probably diluted the impacts of the program among those assessed.

Does Level of Participation Make a Difference?

Two analysis strategies were pursued in addressing the issue of whether more-intense participation in PAT resulted in more-positive outcomes. They produced a mixed picture of results, suggesting that an unequivocal answer to this question is inappropriate. Relationships between intensity of participation and some parent and child outcomes were found, but most

were weak. Stronger relationships were noted between intensity of home visits and parent-child interactions, children's cognitive and physical development, and child health care use, particularly rates of full immunization and treatment for injury. Thus, overall, we found only limited evidence to support the notion that the level of participation in home visits explained a significant portion of the variation in parent and child outcomes assessed in the Multisite Evaluation.

Conclusions

Findings regarding the effectiveness of the Parents as Teachers program from the Multisite Evaluation overall confirm recent advice that we should have "modest expectations" for the impacts of home visiting programs on parents and children. A pattern of positive effects was noted in the evaluation, but most effects were small. Evaluation findings also suggest that PAT may be as effective for the lowest-income families as for those with more moderate incomes. Given that this population can be particularly difficult to affect, this conclusion is encouraging regarding the appropriateness of PAT for a wide range of families.

The strongest and most consistent pattern of effects for any group was noted for families in Site 2, despite measures of participation being uniformly more positive in Site 1. It is unclear precisely what explains the stronger showing in Site 2, although it may relate in part to that program's configuration, with multiple social service agencies being involved in providing home visits to families, often along with other services to support families and children. The greater access to other services that were supportive of parenting and children's development, and that were provided through the PAT agency and/or other agency contacts in Site 2, may have leveraged the PAT program's impacts to produce greater benefits for parents and children in Site 2 than in the other communities. This explanation suggests that PAT is particularly effective when it is one of a portfolio of community services that are available to and accessed by families.

1 INTRODUCTION

Dramatic developments in technology and research in the last several years have created a new, widespread awareness of the importance of children's early years in setting them on a positive developmental trajectory. Research in the fields of neuroscience and early childhood development has made the cover of national news magazines (e.g., *Newsweek*, Fall 2000 special edition), and a wide variety of efforts are under way to help parents understand how to "jump-start" their children's development. For example, numerous Web sites* provide parenting information and advice on how to stimulate the brain development of infants and young children, and the states of Georgia, South Dakota, and Tennessee have launched programs to give audio tapes of music by Mozart to parents of newborns because it is thought to stimulate brain activity and, potentially, enhance development.

This popular media attention to issues of child development reflects the consensus of research in the area. A multiyear project of the National Academy of Sciences recently produced a volume that summarizes what research tells us about development during children's first 5 years (Shonkoff and Phillips, 2000). It asserts that "The course of development can be altered in early childhood by effective interventions that change the balance between risk and protection, thereby shifting the odds in favor of more adaptive outcomes" (p. 32).

Reflecting the value placed on intervention, there is a growing interest in providing programs that help families support positive child development. For example, the California Children and Families Commission is overseeing an investment of $800 million of cigarette tax revenue in expanding programs and services for young children and families in every county in the state. The Parents as Teachers (PAT) program is increasingly turned to as an option in broadening parent education and family support program offerings. PAT encourages positive child development through parenting education that is provided in regular home visits and group meetings by trained parent educators to families with children who are less than school age. More than 2,600 local PAT programs are now active in the United States and internationally (Parents as Teachers National Center, 2001). Although there has been substantial evaluation of PAT, many studies have not employed rigorous designs and/or have employed small samples (see, for example, Pfannenstiel, Lambson, and Yarnell, 1995; Drazen and Haust, 1994). Others have limited generalizability to the PAT program as a whole because they focus on specific subpopulations or a single community (see, for example, Owen and Mulvihill, 1994). Further, few of the earlier studies of PAT have addressed questions of effectiveness with the high-risk families it increasingly is being asked to serve (exceptions are Wagner, Clayton, Gerlach-Downie, and McElroy, 1999; and Wagner, Cameto, and Gerlach-Downie, 1995), and few have addressed the relationship between variations in program factors and variations in outcomes (an exception is Wagner et al., 1999).

To respond to the need for stronger evidence on PAT's effectiveness in general and with low-income families in particular, the Office of Educational Research and Improvement of the U.S. Department of Education, the Smith Richardson Foundation, and the Robert Wood Johnson

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* See, for example, babiestoday.com, iamyourchild.org, and babycenter.com.

Foundation have formed a public-private partnership to support a multisite evaluation of PAT.* SRI International, in cooperation with the Parents as Teachers National Center, is conducting the evaluation of local PAT programs in three communities around the country.**

The results of the Multisite Evaluation, measured at children's first and second birthdays, are reported here. Before presenting those results, we provide an overview of the design of the evaluation and describe the main features of the PAT program. Brief profiles of the three participating local programs then are provided. The conceptual model and evaluation questions that guide the study conclude this chapter.

Design Overview

The PAT Multisite Evaluation is being conducted in three geographically dispersed sites. SRI worked with the PAT National Center staff to use its management information system to identify programs from which to draw the study sample. Selected sites had been in operation for at least 2 years, could provide services to a minimum of 100 new families annually, served a high proportion of low-income families, and offered home visits at least monthly. Sites were visited by PAT National Center staff, who certified that the local programs were appropriate examples of the PAT program.

The design chosen for the PAT Multisite Evaluation in these three communities needed to be rigorous enough to produce persuasive findings that could hold up under scrutiny in both the scientific and policy arenas. An experimental design, the most rigorous evaluation design, has been employed in the evaluation. The central feature of this design is that clients in each community were randomly assigned to a participant or a control group so that the groups would be essentially equal at the outset; differences in outcomes then can be attributed with reasonable confidence to participation in the PAT program. By comparing participants in PAT to a control group, we can determine whether PAT was more effective in helping parents and children achieve positive outcomes than the community services that families might engage in on their own.

Families with infants up to 8 months of age were recruited for the evaluation over a 1-year period. All recruited families were randomly assigned to the participant or control group in their community. The participant group were offered monthly home visits and other PAT services for as long as they chose to remain in the program.† The control group received only the services that normally were available in their community and that they sought at their own initiative. Control group members also received age-appropriate toys through the mail at regular intervals, as a way of tracking the location of families (see discussion of tracking below). Both groups received annual child assessments at or around children's birthdays.

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* The Carnegie Corporation of New York provided support for the design of the evaluation.

** A fourth site was originally included in the evaluation but, for a variety of reasons, did not continue with the study much beyond the recruitment phase.

† Although PAT families typically are served until children are at least age 3, and the evaluation was planned to continue that long, only in Site 1 will the evaluation continue through assessment at children's third birthdays. Largely because of difficulties in engaging and retaining families in both the program and the evaluation, funders of activities in Sites 2 and 3 decided to discontinue the evaluation after the second assessment. Findings measured at children's third birthdays will be reported for Site 1 in 2001.

The core of the evaluation has involved rigorous quantitative measurement of the parent and child outcomes suggested in the evaluation's conceptual framework (please see the related discussion later in this chapter). The large majority of data have been collected through in-home assessments conducted by "field evaluators" who were hired, trained, and supervised by SRI and who were "blind" to the group to which families belonged. The analysis strategy compares outcomes between participant and control group members for the demonstration overall, for low- and more-moderate-income families, and in each community so that the potentially important effects of community context and program differences could be identified. In addition, we have explored the extent to which the effect of the program varied with the level of families' participation.

An Overview of the PAT Program

The Parents as Teachers program is a universal-access, family-focused parent education program that emphasizes parent behavior as the vehicle through which positive impacts on children are to be achieved. This link between parent and child outcomes is evident in the goals PAT seeks to achieve (Winter, 1999):

- Empower parents to give their children the best possible start in life through increased knowledge of child development and appropriate ways to foster growth and learning.
- Give children a solid foundation for school success.
- Prevent and reduce child abuse.
- Increase parents' feelings of competence and confidence.
- Develop true home-school-community partnerships on behalf of children.

The PAT program model is based on the work of Burton White, who believed that all families would be aided by the receipt of expert knowledge on parenting (White, 1985). PAT uses individual, home-based instruction and group interactions to inform parents of young children about good parenting practices and principles of child development. The standard curriculum used in the home visits begins prenatally and emphasizes different developmental stages through the first 3 years of life. Additional curricular materials meet the particular needs of parents of 3- to 5-year-olds, parents who are teenagers, and parents whose children attend child care centers. Improved knowledge in these areas is expected to help parents feel competent in their role and to provide the environment and the personal interactions with their children that will support positive child development. A healthy, well-developed child who is ready for school is the ultimate intended result (Parents as Teachers National Center, 1992).

PAT has enjoyed wide implementation and rapid growth. Begun in Missouri in 1981, the program has expanded to employ nearly 10,000 parent educators to serve families in almost 2,600 sites in 48 states and 6 foreign countries (Parents as Teachers National Center, 2001). In addition to the general appeal of home visiting as a service approach, the popularity of PAT is due in part to the inherent attractiveness of its basic premises: "that babies are born learning and that parents are their first and most influential teachers" (Parents as Teachers National Center, 1997). Also, use of parent educators and provision of only monthly services to most families make PAT a relatively inexpensive program model to implement, compared with interventions

that rely on professionals (e.g., the Prenatal/Early Infancy Project; Olds, Henderson, Tatelbaum, and Chamberlin, 1988), or that have a center-based, child-focused component in a broader two-generation program model (e.g., the Comprehensive Child Development Program; St. Pierre, Goodson, Layzer, and Bernstein, 1994).

PAT also can attribute some of its wide implementation to the fact that the program has incorporated research and evaluation since its inception (e.g., Pfannenstiel and Seltzer, 1989) and that positive impacts on both parents and children have been found (e.g., Pfannenstiel et al., 1995; Drazen and Haust, 1994; Wagner, 1993).

Around the country, PAT programs often are sponsored by school districts, reflecting the emphasis of the program on preparing children for school. However, many community agencies sponsor PAT programs, including hospitals, churches, and social service agencies; PAT also can be part of more comprehensive child-oriented programs, such as Head Start or Even Start programs. The three local PAT programs in the evaluation demonstrate this kind of variation in sponsorship, as well as in other key features. The following section briefly profiles these local programs.

Local PAT Programs in the Evaluation

The three local programs that generously agreed to participate in the Multisite Evaluation differ from each other in important ways; understanding these differences may be helpful in explaining differences we observe in the family participation and outcomes achieved in the three communities.

Site 1. The local PAT program in this Eastern Seaboard urban community is sponsored by the local school district. The PAT program office is housed in a local elementary school, and parent group meetings take place at this school building. This site has brochures to describe the PAT program that are given to all new mothers as part of a community information packet when they leave the hospital after their child's birth. Public health nurses who visit parents of new babies also distribute PAT brochures, encourage participation, and make referrals to the program.

Site 2. This site sponsors a "blended" PAT program in a mid-size Southern city. The program is sponsored by an "umbrella" organization that is focused on child and family issues, but PAT parent educators who were involved with the evaluation were employees of a variety of social service organizations, in addition to some who were employed by the umbrella organization directly. These organizations represent a variety of missions, including serving teen parents and serving families experiencing economic and other kinds of crises. Parent educators had a wider variety of backgrounds than typically is seen in PAT programs, including several social workers, reflecting the range of employing organizations. Although connecting PAT families with other community resources and services is part of the program in most locations, the social service agencies involved in PAT in this community were able to provide an array of family support services directly to their families, as well as linking them to services provided by other organizations, a routine practice among most PAT programs.

Site 3. This PAT program operates in a large Western city and is sponsored by the local school district. Recruitment of new families often occurs through the schools, and parent educators, who are stationed at local elementary schools, emphasize connecting families in the school catchment areas with their schools. Group activities, conducted at the schools, are an important element of the program in this community.

Not only are these three sites organizationally different, but their community contexts dictate that they serve substantially different clienteles (Chapter 2 details the characteristics of the families each served). It is also is important to note that these three programs are not typical of the majority of PAT programs. The requirements of the evaluation that programs have the capacity to serve a large number of new families resulted in selection of programs that all are in urban areas and that are larger than the majority of PAT programs nationally. However, this fact does not suggest, necessarily, that the experiences and outcomes measured in the evaluation are unique to large urban programs.

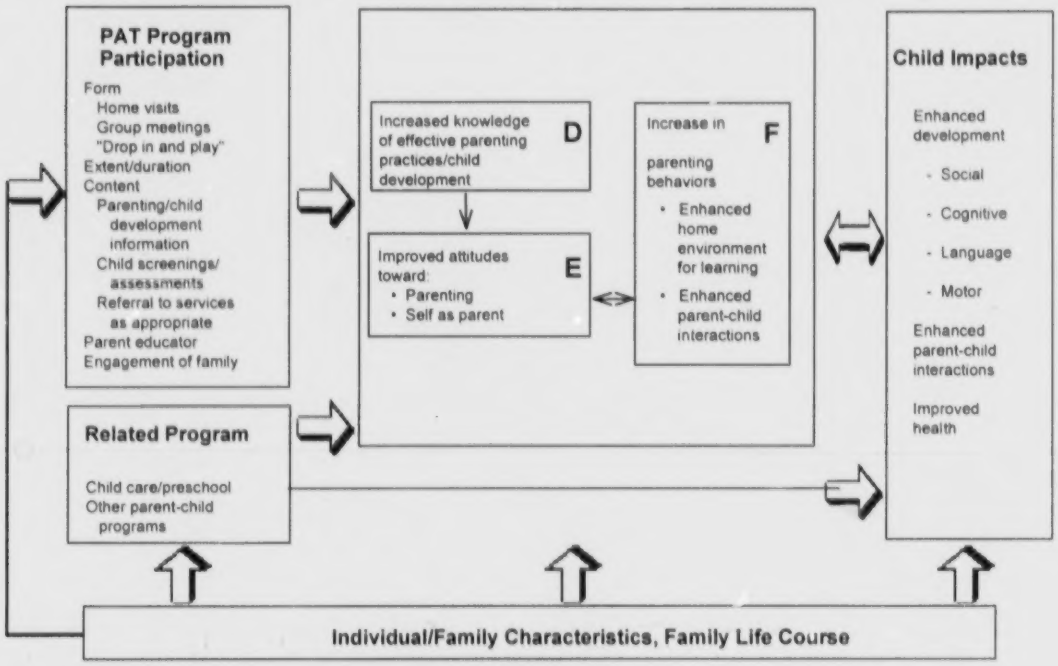
A Conceptual Model of the Multisite Evaluation

The evaluation conducted in the three local PAT programs has been guided by a conceptual framework (Figure 1-1) that identifies the key parent and child outcomes that are the focus of the program, and the relationships between the outcomes and the program itself. The conceptual framework focused the measurement undertaken in the evaluation so that data were available for all components of the framework. It also focused the data analysis strategy so that key relationships depicted in the framework were explored.

Some of the outcomes in Figure 1-1 directly reflect the PAT goals enumerated earlier in this chapter (e.g., parenting knowledge, parent attitudes, parent-child interactions). Other outcomes reflect an effort to define more concretely some PAT goals (e.g., giving children a solid foundation for school success is translated into positive child development in several domains). Not all goals (e.g., reduced child abuse, creating parent-school partnerships) were included in the evaluation because of the time frame of the evaluation or limitations of data access.

The conceptual framework also identifies components of the PAT program, such as length and intensity of services, that are known to vary between families and are hypothesized to contribute to variations in parent and child outcomes. Finally, the framework posits the important influence of individual and family characteristics in helping to explain the participation and outcomes of PAT families.

Figure 1-1
CONCEPTUAL FRAMEWORK OF THE MULTISITE EVALUATION



Evaluation Questions and Expectations

The evaluation questions we have considered reflect the conceptual framework outlined above. They include the following:

- Enrollment (Box A): Who enrolled in the Parents as Teachers program? What were the characteristics of the mothers and children in PAT families, and how did they change over time?
- Attrition (Box B). How well did the program retain the families it enrolled? Who dropped out of PAT?
- Services provided (Boxes B and C). What level of service did PAT families experience, and how engaged were they in those services? Were some kinds of families more active or engaged than others?
- Parent outcomes (Boxes D, E, and F). What impacts did PAT have on parents' knowledge and attitudes and on their behavior toward and interactions with their children? What were outcomes for low-income families?
- Child outcomes (Box G). What impacts did PAT have on children's development and health? What were outcomes for low-income children?
- Effects of program variations. How did variations in families' experience of PAT, particularly the level of participation, relate to variations in their outcomes?

Expectations regarding the answers to these questions that are likely to be generated through the evaluation should reflect an understanding of the knowledge base regarding parent and child

impacts and the relationships between them that have been identified through evaluation of other family support and home visiting programs. A recent review of randomized experimental evaluations of home visiting programs concludes that "results are mixed and, where positive, often modest in magnitude" (Gomby, Culross, and Behrman, 1999, p. 10). We are cautioned that "more modest expectations of programs are needed" (Gomby et al., 1999, p. 15).

This advice may be particularly wise in the context of the Multisite Evaluation. Not only are the knowledge, attitudes, and behaviors of parents difficult to affect in general, but the specific circumstances of the local PAT programs in the evaluation underscore the need for modest expectations. The analysis of program participation presented in Chapter 3 demonstrates the considerable difficulty local programs had in engaging families. In fact, more than one in five families who were randomly assigned to the participant group never began home visits; this percentage ranged from a low of 4% to a high of 33% across the three sites. Despite the fact that these families never really participated in any of the PAT program, they were retained in the evaluation, to the extent their cooperation could be garnered. For example, 22% of those in the participant group whose outcomes were assessed at children's first birthdays had no home visits. Although the inclusion of these families in the participant group is required by the conventions of randomized trial methodology, it dilutes the impacts that are likely to be measured for that group.

Further, participant families who did begin home visits generally received less frequent home visits than the PAT program strives to deliver. Overall, families averaged one visit for every 2 months they were enrolled. This level of receipt of service is typical of home visiting programs. For example, the recent review of home visiting evaluations mentioned above showed that "once families were enrolled, they received on average about half the scheduled number of visits, no matter what the intended frequency was" (Gomby et al., 1999, p. 16). Recognizing the importance of the issue of less-than-expected participation, analyses presented in Chapter 6 address directly the question of whether level of participation made a difference in outcomes for parents and children.

Finally, the findings reported here were measured at or around children's first and second birthdays, but PAT programs intend to serve families through at least children's third birthdays. Thus, the programs had not yet reached their normal conclusion, at which point, presumably, maximum benefits to families who were still participating would have occurred. The assessment at first birthdays, in particular, was very early in most families' experience of PAT, given that many families did not enroll until children were 6 to 8 months old.

The "modest expectations" we hold for the results of the evaluation are reflected in the approaches to analyzing and presenting findings in the remaining chapters of this report. Chapter 2 describes the study sample and addresses the issue of group equivalence at enrollment, at each assessment point, and as the circumstances of families change over time. Chapter 3 describes the experiences of families who were PAT program participants in terms of the durations and levels of services they received and parents' level of engagement in home visits, as reported by parent educators. Chapters 4 and 5 describe parent and child outcomes, respectively, focusing on differences between participant and control groups for the full sample of families and children, for those with very low incomes and those with more moderate incomes, and for those in each community. Parent outcomes are reported at children's first and second birthdays,

whereas child outcomes are reported for 2-year-olds.* Chapter 6 then addresses the relationships between variations in outcomes by children's second birthdays and variations in level of participation. Finally, demonstration results are summarized in Chapter 7, and their implications are highlighted. The evaluation's design and its measurement and analysis approaches are outlined in the appendix.

* Child outcomes were not measured at first birthdays because families had participated for too short a time at that point for parent behaviors to have changed sufficiently to have had an impact on child outcomes.

2 INDIVIDUAL AND HOUSEHOLD CHARACTERISTICS

This chapter has three purposes. First, we describe the characteristics at enrollment of the 667 individuals and households that were recruited into the evaluation in the three participating communities. Understanding key aspects of the families served provides an important context for interpreting findings regarding program participation and outcomes. We then compare the characteristics at enrollment of the participant and control groups to determine whether the random assignment of families resulted in groups that were equivalent. We make this comparison for the initial groups that were randomly assigned and for the groups that were assessed at or near children's first and second birthdays.* These comparisons are important in establishing that differences we observed between the participant and control groups did not result from other differences between them. Finally, we consider the changing circumstances of families over time so that we understand something of the events in their lives that might have helped or hindered participation or achievement of outcomes. Again, we compare participant and control groups. Even if random assignment produced initially equivalent groups, and attrition from the evaluation over time did not result in groups that were different in such factors as age or ethnicity, it is possible that changing life circumstances could have affected the two groups differently, potentially confounding the effects of participating in the PAT program.

Characteristics of Families at Enrollment

To take a broad look at the families enrolled in the evaluation, we assessed a variety of characteristics at enrollment, including:

- Maternal demographics: age, ethnicity, education, and employment status.
- Household characteristics: household composition, socioeconomic status, mothers' responses to statements about stress levels in the household.
- Health status: pregnancy status at enrollment, incidents of low-birth-weight births, mother's and child's general health.
- Mothers' previous experience with infants and information-seeking behavior regarding parenting and children.
- Child care use.

Each of these is discussed below.

* Some families could not be located for or would not participate in the assessments. Overall, 64% of families in the participant and control groups were assessed at children's first and/or second birthdays. Further, the composition of the assessed groups differed at the first and second assessment points. For example, 31% of those assessed at second birthdays could not be located or would not participate in the first assessment, creating the possibility of differences between participant and control groups arising at different points in time. Please see the appendix for further discussion of this issue.

Maternal Demographics

Mothers are the typical participants in PAT home visits, although other family members sometimes also are involved. Knowing who mothers were helped give us a lens through which to view their participation in PAT and their response to PAT in terms of parent outcomes. Table 2-1 describes several demographic characteristics of mothers.

Age. The age of a mother is one proxy for her maturity and, to some extent, life circumstances. Teen mothers often demonstrate a less consistent pattern of participation in programs, but also may be particularly eager to learn more about caring for their new, usually first, child. On average, mothers in the evaluation were 24 years old at enrollment. Overall, 28% of recruited families had teen mothers, but the majority of mothers were in their twenties. The proportion of teen mothers was considerably higher in Site 1 (41%) than in the other communities (22% and 24%, $p<.001$).

Ethnicity. Parenting styles often have cultural roots, making it important to understand the ethnic and racial background of participants. Overall, 29% of enrolled mothers were Caucasian and 58% were African-American. Families with mothers of other ethnicities were 12% of those recruited, most of whom (9%) were Hispanic. Communities varied widely in the ethnicity of mothers they recruited. Site 1 recruited a higher proportion of Caucasian mothers (47%) than the other communities (28% and 14%, $p<.001$). Mothers in Site 2 were predominantly African-American (69%), with almost all others (28%) being Caucasian. Site 3 mothers also were predominantly African-American (66%), with about equal proportions of the rest being Caucasian and other ethnicities (14% and 20%), primarily Hispanic.

Table 2-1
DEMOGRAPHIC CHARACTERISTICS AT ENROLLMENT, BY SITE

	All Families	Site 1	Site 2	Site 3
Mother's age				
Average age	24.1	23.3	24.5	24.5
Percentage younger than 20	28.2	40.8	21.5	23.9
Mother's ethnicity (percentage)				
Caucasian/white	29.4	47.1	27.9	14.0
African-American	58.2	37.4	68.8	65.9
Hispanic/Asian/Other	12.4	15.6	3.2	20.1
Mother's education				
Average highest grade level	12.0	12.5	12.4	11.8
Percentage with:				
Less than high school	36.9	41.3	30.0	40.8
Some postsecondary education	30.4	34.0	38.9	17.1
Percentage currently enrolled in school	17.6	27.8	11.3	15.0
Mother's employment (percentage)				
Working full-time	20.8	20.8	18.2	24.0
Working part-time	14.4	14.1	16.6	11.9
Not working, or seeking work	44.7	43.2	51.4	38.3
Sample size	665	205	247	213

Maternal education and employment. Mothers' levels of education could suggest their propensity toward educational activities in general, including parenting education. Mothers' average educational attainment at enrollment was 12th grade. However, more than one-third of mothers (37%) had not graduated from high school, many of whom were teens and too young to have done so. About 30% of mothers had achieved some postsecondary education. Nongraduates were somewhat less common in Site 2 than in the other communities, consistent with there being fewer teen mothers enrolled in that community. Similarly, the high proportion of nongraduates in Site 1 relates to the larger number of teen mothers enrolled there; mothers there were significantly more likely than those in the other sites still to be enrolled in high school (28% vs. 11% and 15%, $p<.001$ and .01). Mothers in Site 3 were half as likely to have postsecondary education as those in the other sites. More than one-third of mothers (35%) were working full- or part-time when they enrolled.

Household Characteristics

The characteristics of households shape the context within which mothers participate in PAT and parent their children; they also help shape children's earliest experiences. Table 2-2 presents selected household characteristics of families in the evaluation.

Marital status. In recent years, the traditional family context for child raising—families with two married parents in the household—has been giving way to other forms of family. The majority of mothers (54%) in the Multisite Evaluation were single at enrollment; 30% were married, and another 12% were living with a partner. There were no notable differences between the communities on this factor, despite the larger proportion of teen mothers in Site 1, which might be expected to result in a higher proportion of single mothers in that community.

Household composition. At enrollment, 29% of children were living in households with two married parents, although many more children (55%) were living with both parents. In addition, many mothers lived with their family of origin, so that more than 30% of children lived in households with a grandparent. Four of 10 children had siblings. Children in Site 1 were somewhat more likely than others to live with two married parents (36% vs. 26%, n.s.). Interestingly, children there also were more likely than children in the other communities to live in extended, three-generation families (40% vs. 29% and 23%, $p<.01$ and .001) and to be only children (5% vs. 55% and 57%, $p<.001$); this latter pattern is consistent with the higher proportion of first-time teen mothers in Site 1.

Economic status. Poverty can be a substantial negative influence on many aspects of children's lives. Local programs succeeded in recruiting many low-income families, who were of particular interest in the study. Almost 60% of households reported incomes of less than $15,000 per year; 80% reported incomes of less than $25,000. Almost one in five families (18%) reported receiving TANF benefits, and 63% participated in Medicaid. Families in Site 2 were less likely to report very low incomes (51% with incomes of less than $15,000) than were families in the other communities (60% and 69%, $p<.05$ and .001), although Site 2 families had the highest rates of benefit program participation (e.g., 27% received TANF benefits, compared with 10% and 17%, $p<.001$ and .05).

Table 2-2
HOUSEHOLD CHARACTERISTICS AT ENROLLMENT, BY SITE

	All Families	Site 1	Site 2	Site 3
Marital status (percentage)				
Single	54.1	54.7	52.4	55.1
Married	30.4	29.9	36.4	25.9
Living with partner	11.7	11.2	10.2	13.4
Divorced, widowed, separated	3.8	4.2	1.0	5.7
Household composition (percentage)				
Father living in the household	54.8	53.4	40.9	42.2
Household has two married parents	29.1	35.9	25.5	26.5
Three generations living in the household	30.6	40.3	28.7	23.2
Child has siblings	40.2	5.3	55.1	56.9
Household living arrangement (percentage)				
In other's home	37.6	51.7	30.1	32.6
Rented	43.9	21.0	56.5	51.4
Owned their home	18.4	27.3	13.0	16.0
Household socioeconomics (percentage)				
Annual income				
Less than $15,000	59.8	60.5	51.0	69.2
$15,000 to $24,999	20.7	9.8	30.6	19.9
$25,000 to $39,999	7.1	3.9	11.8	4.7
$40,000 or more	12.4	25.9	6.6	6.1
Benefit program participation (percentage)				
AFDC/TANF	18.3	9.8	26.6	17.0
Medicaid	63.2	53.7	79.7	53.4
Household environment (range of items = 1 to 4)				
Percentage who strongly agreed that:				
"The atmosphere in our home is calm."	45.7	61.6	37.6	39.4
"Our home is a good place to relax."	46.2	72.3	31.2	38.3
"This child is a welcome addition to our household"	83.9	93.2	79.4	80.2
Percentage who strongly disagreed that:				
"You can't hear yourself think in our home."	44.5	70.4	30.4	35.4
"This child puts a real strain on our household"	71.7	84.0	63.0	69.9
"It's a real zoo in our home."	47.2	64.2	33.2	47.1
Average household environment scale score (range = 6 to 24)	20.5	21.8	19.9	20.0
Sample size	663	205	247	213

Household environment. The evaluation obtained mothers' assessments of their home environment by asking a series of questions related to the level of stress in their homes, including stress that might result from the new child. Table 2-2 presents the percentages of mothers who gave the most positive response to the questions, strongly agreeing with positive statements and strongly disagreeing with negative statements. Somewhat fewer than half of mothers strongly

agreed that their homes were calm and good places to relax; similar percentages strongly disagreed that "you can't hear yourself think in our home" and that "it's a real zoo in our home." Positive attitudes toward the child in the household were stronger. A large majority of families (84%) strongly agreed that "this child is a welcome addition to our household," and 72% strongly disagreed that "this child puts a real strain on our household." We created an overall scale of parents' ratings of their home environments by summing the scores on these six factors, which produces a scale that ranges from 6 (least positive response on all items) to 24 (most positive response on all items). Overall, families scored 20.5 on this scale of home environment at enrollment, or about 3.5 of 4 on each factor in the scale, indicating quite positive reports of the home environment.

There were substantial differences between communities in these reports, however. Families in Site 1 consistently reported more positively than the others, sometimes having more than twice as many parents reporting the most positive response. For example, 70% of parents in Site 1 strongly disagreed that "you can't hear yourself think in our home," compared with 30% and 35% in Sites 2 and 3, respectively ($p<.001$). Sites 2 and 3 had ratings that generally were similar to each other, with the exception that Site 2 parents were less likely to give the strongest positive response to the statement "it's a real zoo in our home." The stronger positive assessment in Site 1 may relate to the living arrangements there, which emphasized households with two married parents and a pattern of younger mothers living in their parents' homes; incomes also generally were higher. These factors may have generated less stress than was true for other households.

Maternal and Child Health

The health of mothers and children could bear on their ability to participate in PAT and benefit from it. Generally poor health or the challenges of a low-birth-weight infant, for example, could present significant obstacles to participation and create stresses that could affect parenting. Among evaluation families, only a small proportion of mothers enrolled prenatally (Table 2-3), with a somewhat higher proportion apparent in Site 3. More than 1 in 5 mothers (22%) reported having had complications or illnesses during pregnancy, and almost 1 in 10 children were born with low birth weight. The incidences of maternal health problems during pregnancy and low-birth-weight births were somewhat lower in Site 3 than in the other communities. It is unclear whether this difference bears any relationship to the higher percentage of mothers in that community who enrolled in PAT prenatally.

More than half of mothers (52%) reported their health to be excellent, with 24% reporting good, fair, or poor health. Children's health was more likely to be excellent (67%), with only 13% of children having good, fair, or poor health. The reported health of both mothers and children was significantly more positive in Site 1 than in the other communities. The better reported health of mothers might be related to the high proportion of young mothers in that community. However, it is unclear why children's health was so much more likely to be reported as excellent in Site 1. Mothers and children in Site 2 were the least likely to be reported as having excellent health.

Table 2-3
MATERNAL AND CHILD HEALTH AT ENROLLMENT, BY SITE

	All Families	Site 1	Site 2	Site 3
Pregnancy status (percentage)				
Mother enrolled pregnant	15.4	12.6	12.2	22.0
Mother had serious pregnancy complications	21.8	25.7	24.3	14.5
Child was low birth weight (percentage)	9.7	10.8	12.3	5.4
Mother's overall health (percentage)				
Excellent	52.0	90.2	25.5	46.0
Very good	23.5	4.9	37.3	25.4
Good, fair, or poor	24.5	4.9	37.3	28.6
Child's overall health (percentage)				
Excellent	67.1	97.8	45.3	64.5
Very good	19.8	.0	33.2	22.5
Good, fair, or poor	13.1	2.3	12.5	13.0
Sample size	665	205	247	213

Experience with and Knowledge of Infants

We have already noted that both new and experienced mothers enrolled in the evaluation. It is also interesting to determine other kinds of experiences mothers may have had with children, as context for understanding what they knew and what they may have had to learn through participation in PAT. Table 2-4 presents information on these factors.

Previous experience with infants. Few mothers reported that they were novices at taking care of infants when they enrolled in PAT. In addition to 40% of mothers having had children previously, 59% reported that they had taken care of other people's infants regularly. More than half of mothers (53%) had previously taken one or more classes about parenting or children, and one-third of mothers had been paid for working with children previously. There were no meaningful differences between communities on these factors.

Information seeking about children. How did parents obtain information about parenting and children before enrolling in PAT? Friends and relatives were by far the most common source of information regarding parenting and children, with almost 72% of mothers reporting they used these information sources weekly or more often. Overall, 47% reported seeking information from books and magazines at least weekly, and about 3 in 10 sought information from TV or movies and from medical professionals at least weekly, respectively. Given mothers' experience and this level of information seeking, it is not surprising that almost half of mothers (47%) reported their knowledge of children to be "high." There were no substantial differences between communities on these factors, with the exception that mothers in Site 2 were somewhat more likely than others to rate their knowledge of infants as high (54% vs. 44% and 41%, $p<.05$ and .01).

Table 2-4
MOTHER'S PREVIOUS EXPERIENCE WITH INFANTS, AND INFORMATION SEEKING AT ENROLLMENT

	All Families	Site 1	Site 2	Site 3
Percentage who previously had taken care of babies other than their own:				
No more than once or twice	16.6	15.0	14.1	20.6
Sometimes, but not regularly	24.8	29.1	23.1	22.5
Regularly, once a month or more	58.8	55.8	62.8	56.9
Percentage who had ever taken a class on child care	53.2	58.7	49.0	50.2
Percentage who had ever had a job involving child care	33.6	34.0	37.2	29.1
Percentage seeking information on children or parenting weekly or more often from:				
Relatives or friends	71.5	79.2	69.8	65.8
Magazines or books	46.9	59.7	45.8	35.4
TV, movies, or the radio	30.4	28.2	35.0	27.2
Doctors, nurses, or other professionals	28.0	33.5	28.2	22.3
Average scale score for information-seeking behavior related to children/parenting	9.2	9.6	9.4	8.7
Percentage who assessed own knowledge of infants as:				
Little/some	11.1	18.9	4.9	10.9
Fairly good	42.2	40.3	41.3	45.0
High	46.7	40.8	53.8	44.1
Sample size	662	206	247	211

Child Care Use

Finally, we examined the level of involvement in child care of children at enrollment (Table 2-5). Perhaps mothers who had regular help with caring for children were less stressed than those who cared for children full-time. Alternatively, these mothers also may have been working or attending school, adding external demands on their time. In either case, mothers with children in child care spent less time with them than did other mothers. Among evaluation families, almost 30% of children were regularly being taken care of by adults other than their parents. Children in nonparental care spent an average of almost 34 hours per week in the care of adults other than their parents, with no marked variation among communities in child care use.

Table 2-5
CHILD CARE USE AT ENROLLMENT, BY SITE

	All Families	Site 1	Site 2	Site 3
Percentage in regular child care	29.6	27.3	34.6	25.8
Percentage with hours per week in child care (of those in care):				
Less than 20 hours	7.7	10.0	3.0	13.5
20 to 35 hours	37.8	32.5	47.0	27.0
More than 35 hours	54.6	57.5	50.0	59.5
Average hours in child care (of those in care)	33.4	32.8	33.6	33.9
Sample size: Child care use	557	203	241	206
Children in child care	143	40	66	37

Summary

It is clear that the PAT evaluation communities were successful in recruiting diverse families, including a sizable proportion of families who were at risk because of low income, teen parents, single parents, and other factors. It also is clear that there were substantial differences between the three communities in the kinds of families that were recruited. These differences could account for substantial variation in the patterns of participation and outcomes assessed for families. Therefore, all analyses for the demonstration are reported both for the sample of families as a whole and for families in each community separately.

Having this understanding of the characteristics of families provides an important context for understanding their participation and outcomes. However, assessing outcomes accurately requires a confidence that the participant and control groups that are being compared are equivalent on the kinds of factors described thus far. If there were substantial differences between the participant and control groups, either for the full sample or in any community, those differences could mask or generate differences in outcomes that would hamper our efforts to determine the effects of participating in the PAT program. The following section addresses the issue of participant and control group equivalence.

Participant and Control Group Equivalence at Enrollment

In the discussion thus far, we have seen that differences between the demonstration communities in the families they enrolled could be important in understanding differences in patterns of participation or outcomes that we observe. It also is important to determine whether there were systematic differences between the participant and control groups that also could help explain differences in outcomes. Random assignment of families to the participant and control groups is the best way to avoid systematic differences between the groups, other than their participation in the PAT program. However, differences could occur by chance that could influence outcomes. For example, if the participant group included mothers who at enrollment were more predisposed to seek information about children or to think they were well informed about children than those in the control group, participants could score better on measures of parenting knowledge than the control

group, regardless of their participation in the PAT program. These kinds of differences need to be identified and controlled for in analyses in order to have a clear picture of the impacts of the program.

We carefully examined the characteristics at enrollment of the participant and control groups to identify any differences between them on the kinds of characteristics described earlier in this chapter. We also examined these characteristics of the families from the participant and control groups who took part in the assessments at the first and second birthdays. Because only 64% of families participated in an assessment, it is possible that those from the participant and control groups who chose to be assessed could differ from each other at one or both assessments, despite being equivalent at the outset. Also, the fact that the membership of the groups being assessed varied over time (e.g., 31% of those assessed at second birthdays were not assessed at first birthdays) means that there were opportunities for group differences to emerge at different points in time. The results of our assessment of group equivalence on characteristics at enrollment are presented in Tables 2-6 through 2-10.*

These tables reveal no significant, systematic differences on enrollment characteristics between the participant and control groups initially or at children's first or second birthdays for families as a whole. The groups were virtually identical on all factors. However, there were differences between participant and control groups on a handful of factors in specific communities. Table 2-6 shows that, in Site 1, the ethnic distribution differed between participant and control group mothers, with the participant group having more Caucasian mothers than the control group. This difference was apparent for the groups at all three points in time, but reached statistical significance for those participating in the first assessment (72% vs. 48%, $p<.05$). To the extent that parent or child outcomes differ for different ethnic groups, differences we observe between groups in Site 1 could be confounded by this difference in ethnic distribution.

Regarding household characteristics, Table 2-7 shows a statistically significant difference in Site 2 between the initially randomly assigned groups in the percentage of families with more than one child (66% vs. 48%, $p<.01$). However, this difference was not maintained for the groups that participated in either assessment; therefore, it is unlikely to have influenced differences in outcomes between the groups that were measured in those assessments. There were no other differences in household characteristics, and none were found regarding maternal or child health (Table 2-8).

Participant and control group mothers in Site 3 differed markedly in their reported knowledge of infants at the time of enrollment (Table 2-9). This difference was apparent for the initially randomly assigned groups and for those participating in the first and second assessments, the

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* In the interests of parsimony, not all characteristics reported in earlier tables are repeated here; we selected factors considered most important as contexts for parenting and those for which differences were noted earlier. In some cases, not all categories of the variables are presented. All significant differences are presented.

Table 2-6
GROUP EQUIVALENCE IN MOTHERS' DEMOGRAPHIC CHARACTERISTICS AT ENROLLMENT, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Mother's average age								
At enrollment	24.3	24.3	23.9	22.8	24.4	24.5	24.1	24.8
At 1-year assessment	24.9	24.8	26.0	24.2	25.1	25.6	24.0	24.3
At 2-year assessment	24.1	24.5	25.3	24.7	24.1	23.3	23.4	24.8
Mother's ethnicity (percentage)								
At enrollment								
Caucasian/white	29.8	29.1	53.7	42.7	24.2	30.4	14.9	13.3
African-American	57.1	58.9	32.9	40.3	70.7	67.6	63.8	67.5
Hispanic/Asian/Other	13.1	12.0	13.4	16.9	5.0	2.1	21.3	19.2
At 1-year assessment								
Caucasian/white	31.8	33.5	**72.2**	**48.2***	30.0	35.1	9.7	18.8
African-American	57.4	56.4	22.2	39.3	64.0	62.3	72.6	64.1
Hispanic/Asian/Other	10.8	10.2	5.6	12.5	6.0	2.6	17.7	17.2
At 2-year assessment								
Caucasian/white	31.5	28.3	64.7	53.2	33.3	34.3	8.0	10.4
African-American	62.0	59.1	35.3	34.0	62.5	62.9	80.0	72.7
Hispanic/Asian/Other	6.5	12.6	.0	12.8	4.2	2.9	12.0	16.9
Average highest grade level achieved								
At enrollment	12.1	12.0	12.5	12.2	12.2	12.2	11.6	11.5
At 1-year assessment	12.4	12.3	13.7	13.0	12.2	12.4	11.8	11.5
At 2-year assessment	12.3	12.1	12.8	12.7	12.3	12.1	11.9	11.6
Percentage not high school graduates								
At enrollment	35.4	38.0	40.2	41.9	26.3	32.4	40.9	40.7
At 1-year assessment	32.4	31.1	27.8	33.9	30.0	24.7	37.1	36.5
At 2-year assessment	31.5	31.0	26.5	34.0	25.0	28.6	38.0	30.3
Percentage not working, or seeking work								
At enrollment	42.2	46.4	39.0	46.0	49.5	52.7	37.2	39.2
At 1-year assessment	60.2	58.7	39.3	53.8	71.7	61.1	61.1	60.0
At 2-year assessment	52.6	58.3	40.7	59.5	69.6	52.9	51.1	60.3
Sample size: At enrollment	275	390	82	123	99	148	94	119
At 1-year assessment	147	197	36	56	50	77	61	64
At 2-year assessment	107	159	34	47	24	35	49	77

Bold type indicates moderate and large effects. Statistically significant difference between groups in a two-tailed test at the following level: * $p<.05$.

Table 2-7
GROUP EQUIVALENCE IN HOUSEHOLD CHARACTERISTICS OVER TIME, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Percentage with two married parents								
At enrollment	34.7	25.1	43.9	30.6	33.3	20.3	28.0	25.4
At 1-year assessment								
At 2-year assessment	29.6	27.0	47.1	36.2	33.3	25.7	16.0	22.1
Percentage of children with siblings								
At enrollment	45.6	36.4	7.3	4.0	**65.7**	**48.0****	58.1	55.9
At 1-year assessment								
At 2-year assessment	43.0	38.6	11.8	2.1	50.0	54.3	61.2	54.0
Household annual income (percentage)								
At enrollment								
Less than $15,000	57.4	61.4	55.6	63.7	49.5	52.0	67.4	70.6
$40,000 or more	12.8	12.1	30.8	22.6	4.0	8.2	6.6	5.9
At 1-year assessment								
Less than $15,000	51.7	57.2	36.1	53.6	52.0	53.3	60.7	65.1
$40,000 or more	18.4	15.5	55.6	35.7	6.0	8.0	6.6	6.4
At 2-year assessment								
Less than $15,000	54.2	56.7	52.9	48.9	50.0	41.2	57.1	68.4
$40,000 or more	14.0	13.4	32.4	31.9	.0	8.8	8.2	4.0
Percentage participating in TANF								
At enrollment	18.1	18.4	8.8	10.6	29.6	24.5	13.8	19.3
At 1-year assessment	18.8	17.6	5.6	10.9	38.0	21.3	10.3	19.0
At 2-year assessment	17.6	18.0	9.1	4.3	33.3	27.3	15.6	22.4
Average household environment scale score								
At enrollment	15.3	15.3	15.3	15.2	15.6	15.4	14.9	15.3
At 1-year assessment	15.3	15.3	15.3	15.1	15.7	15.5	14.8	15.1
At 2-year assessment	15.1	15.4	15.2	15.2	15.7	15.6	14.8	15.4
Sample size: At enrollment	275	390	82	123	99	148	94	119
At 1-year assessment	144	193	36	55	50	75	58	63
At 2-year assessment	107	157	34	47	24	34	49	76

Bold type indicates moderate and large effects. Statistically significant difference between groups in a two-tailed test at the following level: ** p<.01.

Table 2-8
GROUP EQUIVALENCE IN MATERNAL AND CHILD HEALTH OVER TIME, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Mother's overall health (percentage)								
At enrollment								
Excellent	50.2	53.3	90.2	90.2	25.2	25.7	41.5	49.6
Good, fair, or poor	23.6	15.2	3.7	4.1	38.4	36.5	25.6	31.0
At 1-year assessment								
Excellent	49.3	51.8	94.4	90.9	22.0	27.3	45.2	47.6
Good, fair, or poor	25.7	27.7	2.8	5.4	46.0	36.4	22.6	36.5
At 2-year assessment								
Excellent	60.2	54.1	94.1	93.5	29.2	20.0	52.0	46.0
Good, fair, or poor	22.2	26.8	2.9	2.2	50.0	37.1	22.0	36.8
Child's overall health (percentage)								
At enrollment								
Excellent	68.5	66.2	97.2	98.2	49.5	42.4	64.4	64.6
Good, fair, or poor	14.3	12.3	2.8	1.8	23.7	20.1	13.7	11.5
At 1-year assessment								
Excellent	69.2	65.8	96.9	96.2	51.1	48.1	68.6	61.8
Good, fair, or poor	15.4	12.5	3.1	3.8	25.5	16.9	13.7	14.6
At 2-year assessment								
Excellent	73.4	65.3	96.4	97.4	52.2	41.2	69.8	59.4
Good, fair, or poor	11.7	14.2	3.6	2.6	17.4	23.5	14.0	15.9
Sample size: Mother's health at enrollment	275	390	82	123	99	148	94	119
At 1-year assessment	148	195	36	55	50	77	62	63
At 2-year assessment	208	157	34	46	24	35	50	76
Sample size: Child's health at enrollment	275	390	82	123	99	148	94	119
At 1-year assessment	130	184	32	52	47	77	51	55
At 2-year assessment	94	141	28	38	23	34	43	69

Table 2-9
GROUP EQUIVALENCE IN PARENTS' INFORMATION SEEKING OVER TIME, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Percentage who had previously regularly cared for babies								
At enrollment	64.4	63.3	56.4	62.3	64.5	65.5	72.2	61.4
At 1-year assessment	65.2	67.0	51.5	61.5	66.0	73.7	73.1	63.2
At 2-year assessment	65.0	61.5	58.1	64.3	64.0	64.7	70.4	58.2
Percentage who had taken a child care/parenting class								
At enrollment	55.8	51.3	63.4	55.6	54.6	48.6	50.5	50.0
At 1-year assessment	55.8	52.8	72.2	57.1	54.0	45.4	47.5	57.8
At 2-year assessment	57.0	53.5	67.6	57.4	54.2	45.7	51.0	54.6
Mean scale score for information-seeking behavior related to children/parenting								
At enrollment	9.2	9.2	9.6	9.6	9.5	9.3	8.5	8.8
At 1-year assessment	9.1	9.4	10.1	9.9	9.5	9.5	8.3	8.8
At 2-year assessment	9.1	9.3	9.8	10.0	9.3	9.2	8.5	8.9
Percentage who assessed own knowledge of infants as "high"								
At enrollment	47.3	46.3	36.6	42.6	49.5	56.8	**54.4****	**36.1**
At 1-year assessment	46.6	50.5	30.6	51.8	50.0	58.4	53.3	39.7
At 2-year assessment	46.2	39.0	41.2	34.0	33.3	54.3	56.3	35.1
Sample size: At enrollment	273	389	82	124	99	148	93	120
At 1-year assessment	143	194	36	56	50	77	57	61
At 2-year assessment	105	154	34	47	24	35	47	72

Bold type indicates moderate and large effects. Statistically significant difference between groups in a two-tailed test at the following level: ** p<.01.

difference being statistically significant for the initial groups (54% vs. 36%, $p<.01$). No meaningful differences were apparent between groups overall or in any sites regarding child care use at enrollment (Table 2-10).

The differences between groups noted above were accounted for through the use of multivariate analyses of outcomes, as reported in Chapters 4 and 5. Through this technique, differences between groups were held constant statistically so that the effects of participating in PAT were disentangled from the effects of other differences between the groups.

Changing Family Circumstances

In this section, we explore the circumstances of families at the time they were assessed, in an effort to understand factors that may have influenced their participation in the program up to that point or the outcomes we measured. Although this analysis compares participant and control groups, as did the analysis in the preceding section, this analysis differs in that it describes family conditions at the point of assessment, rather than the initial equivalence at enrollment, of the groups being assessed. Findings are reported in Tables 2-11 through 2-15.

Individual and Household Characteristics

Table 2-11 reveals that the percentage of households with two married parents increased among the groups assessed at children's first and second birthdays. For example, fewer than 30% of families who participated in the second assessment had two married parents when they enrolled, whereas about 40% of households had married parents at the time of the assessment. The increase was largest in Site 3, where only about one in five families participating in the second assessment included two married parents at enrollment; almost one-third did so at the time of the second assessment. This change in marital status might have brought greater stability to households, which might have benefited both mothers and children. Generally, the participant and control groups were similar on this measure of household composition; although there is a sizable difference in Site 1 at the first assessment favoring the participant group, it did not reach statistical significance.

Overall, about one-fourth of mothers who participated in the assessment when children were 2 years old were pregnant again at the time or had had another child in the preceding year. Thus, there was not a large increase in the proportion of enrolled children who had siblings in the sample overall, although a larger increase was noted in Site 1, where a large proportion of enrollees were first-time mothers. It is not surprising that they might be more likely to have another child in the ensuing 2 years than would mothers who already had two or more children. However, it is important to note the significant difference between the participant and control groups on this factor. Participant families were significantly more likely to have two or more children than were control group families (52% vs. 38%, $p<.01$), with the largest difference

Table 2-10
GROUP EQUIVALENCE IN CHILD CARE USE OVER TIME, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Percentage in regular child care								
At enrollment	28.1	30.7	25.7	28.3	34.1	34.9	23.7	27.5
At 1-year assessment	32.0	34.3	34.4	34.6	28.3	32.4	34.0	36.4
At 2-year assessment	34.4	33.1	28.6	34.2	36.4	35.5	37.2	31.2
Average hours in child care (of those in care)								
At enrollment	32.4	34.1	32.3	33.0	33.0	33.9	31.5	35.6
At 1-year assessment	32.9	35.2	--	34.2	--	34.1	31.5	37.5
At 2-year assessment	31.8	32.5	--	--	--	--	--	33.9
Sample size: Child care use								
At enrollment	231	326	81	117	96	141	89	109
At 1-year assessment	128	178	32	52	46	71	50	55
At 2-year assessment	93	130	28	38	22	31	43	61
Sample size: Children in child care								
At enrollment	53	90	15	25	23	43	15	22
At 1-year assessment	35	54	10	15	10	22	15	17
At 2-year assessment	29	40	7	12	8	11	14	17

Table 2-11
CHANGING INDIVIDUAL AND HOUSEHOLD CIRCUMSTANCES, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Percentage of households with two married parents								
At 1-year assessment	46.4	41.0	66.7	53.6	40.8	35.3	37.2	35.7
At 2-year assessment	40.0	37.7	48.5	45.4	41.2	38.5	32.5	31.7
At second assessment, mother was pregnant or had had another child in the preceding year	24.8	30.4	23.5	38.3	24.0	28.6	26.0	26.3
Percentage of children with siblings								
At 1-year assessment	**52.4**	**38.1****	12.1	5.9	**71.4**	**49.3***	59.0	50.8
At 2-year assessment	49.5	46.8	26.5	17.0	64.0	65.7	58.0	56.6
Average Maternal Social Support Scale score								
At 1-year assessment	10.0	10.2	11.0	11.2	9.1	9.4	10.1	10.3
At 2-year assessment	10.0	9.8	9.8	10.5	9.0	8.9	10.6	9.9
Household annual income (percentage)								
At 1-year assessment								
Less than $15,000	47.1	37.9	25 0	20.4	53.2	46.3	54.4	44.4
$40,000 or more	19.8	27.3	60.7	61.2	6.4	11.9	8.7	13.3
At 2-year assessment								
Less than $15,000	36.0	35.9	18.2	8.6	42.1	29.6	42.2	52.2
$40,000 or more	25.6	25.2	45.4	57.1	10.5	14.8	22.2	13.0
Percentage with change in government benefit program participation between assessments								
No change	79.8	77.9	88.2	86.7	82.3	80.0	76.1	71.4
Began receiving benefits in year 2	5.1	5.8	.0	.0	.0	.0	8.7	12.2
Stopped receiving benefits in year 2	15.2	16.4	11.8	13.3	18.8	20.0	15.2	16.3

Bold type indicates moderate and large effects. Statistically significant difference at the following levels: ** p<.01, * p<.05.

Table 2-11
CHANGING INDIVIDUAL AND HOUSEHOLD CIRCUMSTANCES, BY SITE (Concluded)

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Average number of community agencies family contacted, went to, or got help from								
At 1-year assessment	2.0	1.9	1.4	1.7	3.0	2.3	1.7	1.7
At 2-year assessment	1.6	1.7	1.4	1.5	1.7	1.9	1.6	1.8
Percentage reporting contacting, going to, or getting help from:[1]								
Parenting support/information/classes								
At 1-year assessment	47.6	47.4	52.9	50.0	76.7	65.3	22.6	23.8
At 2-year assessment	23.2	23.4	27.3	23.9	36.0	37.1	14.0	16.9
Child care agencies/referral sources								
At 1-year assessment	18.2	20.8	29.4	40.7	17.0	10.7	12.9	15.9
At 2-year assessment	15.7	17.1	15.2	23.9	20.0	14.3	14.0	14.3
Health/health education agency								
At 1-year assessment	35.0	46.4	14.7	20.4	63.8	77.3	24.2	31.8
At 2-year assessment	25.9	27.8	27.3	21.7	36.0	28.6	20.0	31.2
Family/child counseling or evaluation								
At 1-year assessment	7.7	5.2	5.9	3.7	8.5	2.7	8.1	9.5
At 2-year assessment	4.6	10.8	3.0	4.4	.0	8.6	8.0	15.6
Substance abuse counseling/treatment								
At 1-year assessment	3.5	.5	.0	.0	8.5	1.3	1.6	.0
At 2-year assessment	.9	.0	.0	.0	.0	.0	2.0	.0
Family crisis services								
At 1-year assessment	21.0	17.2	.0	3.7	31.9	21.3	24.2	23.8
At 2-year assessment	17.6	17.1	9.1	.0	20.0	22.9	22.0	24.7
Sample size (1-year/2-year assessment)	144/107	193/157	36/34	55/47	50/24	75/34	58/49	63/76

[1] Families could report contacting more than one agency in a category.

occurring in Site 2 (71% vs. 49%, $p<.05$). The greater demands posed on participant group mothers by two or more children could potentially affect the outcomes they achieved.

At the time of the two assessments, mothers were asked to report on the extent to which they experienced several key dimensions of social support, including help with daily tasks, satisfaction with visits from relatives, help with crises, emergency child care, satisfaction with communication from a male support figure and from another adult, and community involvement.* Mothers scored an average of 10 points of a total possible 19 points, with scores being stable over time for the full sample of families. However, we noted a decline of more than a full point for participant group mothers in Site 1, a decline not matched by another group. This also is the group in which the proportion of households with only one child decreased most markedly.

Household incomes improved steadily over time for the sample as a whole. For example, at enrollment, 57% of the participant group families had incomes of less than $15,000. This percentage declined to 47% at the first assessment and 36% among those participating in the second assessment. The percentage of families with incomes of more than $40,000 increased correspondingly, from 13% of participants at enrollment to 26% at the second assessment. However, not all families benefited equally. Whereas the percentage of families in Site 1 with incomes below $15,000 dropped dramatically (e.g., from 56% at enrollment to 18% at the second assessment among participants), the percentage of families in Site 2 in the lowest income category was fairly stable for participant group families. Similarly, in Site 2, the percentage of families with incomes greater than $40,000 was largely unchanged.

Consistent with the increases in income noted, about 15% of households that had been participating in one or more government benefit programs at the first assessment no longer were doing so at the time of the second assessment. Only about 5% of families were new participants in a government benefit program during their second year in the evaluation. All new participants in government benefit programs were in Site 3.

We also were interested in other forms of family support, in addition to benefit program participation. As part of the Family Survey conducted as part of the assessments, parents were asked whether they had contacted, gone to, or gotten help from one or more of a list of local social service agencies of various kinds. Families who participated in the first assessment had contacted or gotten help from two such agencies in the preceding year, on average, with the highest level of contact with social service agencies occurring among participant group families in Site 2 at the first assessment. For example, participant group members in Site 2 contacted an average of 3 agencies in their children's first year, compared with 1.4 and 1.7 in Sites 1 and 3 ($p<.001$). Site 2 had a local program that was sponsored by an "umbrella" organization, where PAT parent educators worked directly for a variety of social service agencies and where connecting families to needed services was a high priority for some of those agencies. The level of contact with agencies declined slightly over time, with families who participated in the second assessment not differing from each other on this factor across the communities.

The most commonly accessed agencies in children's first year were those providing parenting information and support (48%). In children's second year, health and health education

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* Please see the appendix for a discussion of the 21-item Maternal Social Support Index (MSSI).

agencies were about as frequently contacted as parenting information and support agencies (23% and 26%). Child care providers and referral agencies and family crisis service agencies (e.g., food closets, shelters) were contacted by similar percentages of families in both years, ranging from 16% to 21%. The higher level of contacts with agencies noted for Site 2 in the first year resulted primarily from contacts with parenting information and support and health and health education agencies, which were contacted by between 64% and 77% of families in the participant and control groups. Families in Site 1 were considerably more likely than other families to have contacted child care agencies and referral sources and considerably less likely to have contacted family crisis service organizations.

Maternal and Child Health

The general status of children's health that was reported by mothers declined somewhat over time (Table 2-12). Although the percentage of children reported to have excellent health was fairly stable for the sample overall at enrollment and the first assessment (e.g., 69% and 64% for the participant group children in the full sample), it declined for children at the second assessment (e.g., 51% were reported to have excellent health at that time). The reported health decline for children was most marked in Site 1, where the highest rating of excellent health had been given at enrollment; for example, 97% of those participating in the second assessment were reported to have had excellent health at enrollment, a percentage that dropped to 56% at the time of the second assessment, making children in that site comparable to others.

Information-Seeking Behavior

The reported propensity of parents to seek information about children and parenting increased over time for all groups (Table 2-13). For example, whereas the information-seeking scale score was just over 9 at the time of enrollment for parents who participated in the second assessment, scores were 12 or higher for many groups at the time of that assessment. Perhaps as children aged, parents became more eager for information to deal with the expanding array of experiences and challenges they presented. There were no meaningful differences between participant and control groups on this factor.

At both assessments, parents were asked to report on their own literacy activities, to provide a context for understanding the literacy-promoting behaviors they might engage in with their children. A personal literacy scale was constructed from parents' reports of the frequency with which they read newspapers, magazines, and books, went to the library, and got information from a computer or the Internet. On a scale ranging from 5 to 25, parents who participated in assessments scored an average of 13 to 14, or an average of "about weekly" for each of these activities. Scores did not change systematically over time or vary across communities, with the exception that mothers in Site 1 were marginally more active than others on this dimension, consistent with the fact that Site 1 mothers were better educated, on the whole, than others.

Table 2-12
MATERNAL AND CHILD HEALTH OVER TIME, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Percentage reporting mother's health								
At 1-year assessment								
Excellent	64.2	69.5	75.0	87.5	58.0	64.9	62.9	59.4
Good, fair, or poor	11.5	8.6	8.3	.0	12.0	11.7	12.9	12.5
At 2-year assessment								
Excellent	50.9	30.6	55.9	63.8	50.0	32.4	48.0	50.6
Good, fair, or poor	20.4	18.4	17.6	14.9	12.5	17.6	26.0	20.8
Percentage reporting child health								
At 1-year assessment								
Excellent	64.2	69.5	75.0	87.5	58.0	64.9	62.9	59.4
Good, fair, or poor	11.5	8.6	8.3	.0	12.0	11.7	12.9	12.5
At 2-year assessment								
Excellent	50.9	50.6	55.9	63.8	50.0	32.4	48.0	50.6
Good, fair, or poor	20.4	18.4	17.6	14.9	12.5	17.6	26.0	20.8
Sample size (1-year/2-year assessment)	148/109	197/157	36/34	56/47	50/25	77/33	62/50	64/77

Table 2-13
CHANGING INFORMATION-SEEKING BEHAVIOR, BY SITE

	All Families		Site 1		Site 2		Site 3	
	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group	Participant Group	Control Group
Average information-seeking scale score								
At 1-year assessment	12.5	12.0	12.6	12.6	12.1	11.8	12.6	11.9
At 2-year assessment	11.8	12.6	11.8	12.6	10.7	12.4	12.4	12.7
Parent's personal literacy scale score								
At 1-year assessment	13.5	13.2	14.9	14.1	13.0	13.3	13.0	12.4
At 2-year assessment	14.0	13.4	14.4	14.2	13.0	13.9	14.1	12.6
Sample size (1-year/2-year assessment)	148/109	195/157	36/34	56/47	49/25	76/33	62/50	63/77

Children's Activities

Knowing how children were spending their time at the point they were assessed as 2-year-olds could suggest factors that were contributing to or detracting from their development. Table 2-14 indicates that participant group children were significantly more likely than control group children to have taken part in at least one organized children's activity in the preceding year (44% vs. 31%, $p<.05$), such as story hour at the library, a "Mommy and Me" play group, or other activities. Some of these could have been associated with PAT participation, since parent support and children's play groups were sponsored by some programs. The greatest frequency of attendance at such groups was noted for participant group children in Site 1, where 62% were reported to have attended organized children's activities, compared with 35% of control group children ($p<.05$).

About 40% of 2-year-old children in the evaluation overall watched at least 3 hours of television a day, a doubling of the percentage watching that much television since the first assessment. Children in Site 3 were significantly more likely to watch this much television than children in the other communities (more than half in Site 3, compared with 28% in Site 1, for example, $p<.05$). However, it was in Site 2 where a significant difference between participant and control group children was found, with participant group children being significantly more likely to watch 3 or more hours of television per day (36% vs. 21%, $p<.05$). Group differences in attending organized activities and watching television are controlled for statistically in multivariate analyses of children's outcomes in Chapter 5.

Not surprisingly, the proportion of children in regular child care increased markedly as children aged (Table 2-14). For example, among children who were assessed at second birthdays, 28% had been in regular child care at the time of enrollment; more than 70% of 2-year-olds were in such care. The number of hours 2-year-olds were in child care averaged 38, a slight increase from an average of 33 at enrollment. Parents generally were happy with the child care arrangements of their children; more than three-fourths of parents with children in regular child care reported being very happy with their child care arrangement(s). There were no meaningful differences between groups or sites on these factors.

Summary

In this section, we have described the circumstances of families at the time they were enrolled in PAT and when they were assessed at children's first and second birthdays. This analysis helps us understand the context within which parents were raising their children. It is clear that local programs were successful in recruiting a diverse population, including a large proportion of families with low incomes, so that the effectiveness of PAT with such families could be evaluated.

Table 2-14
ACTIVITIES OF 2-YEAR-OLDS, BY SITE

	Participant Group	Control Group
All Families		
Percentage of children who attended organized children's group activity in the past year (e.g., story hour at the library)	44.4	31.0
Percentage of children watching television 3 or more hours a day	43.1	38.0
Percentage of children in regular child care	70.3	74.8
Mean hours in child care	38.1	35.0
Percentage of parents who reported being "very happy" with their child care arrangement	79.4	75.4
Site 1		
Percentage of children who attended organized children's group activity in the past year (e.g., story hour at the library)	61.8	34.8
Percentage of children watching television 3 or more hours a day	29.4	27.7
Percentage of children in regular child care	78.2	80.0
Mean hours in child care	37.2	32.7
Percentage of parents who reported being "very happy" with their child care arrangement	80.8	71.9
Site 2		
Percentage of children who attended organized children's group activity in the past year (e.g., story hour at the library)	25.0	28.1
Percentage of children watching television 3 or more hours a day	36.0	20.6
Percentage of children in regular child care	68.2	73.3
Mean hours in child care	39.4	35.7
Percentage of parents who reported being "very happy" with their child care arrangement	53.8	69.5
Site 3		
Percentage of children who attended organized children's group activity in the past year (e.g., story hour at the library)	42.0	29.9
Percentage of children watching television 3 or more hours a day	56.0	52.0
Percentage of children in regular child care	66.0	72.2
Mean hours in child care	38.2	36.1
Percentage of parents who reported being "very happy" with their child care arrangement	88.2	80.0
Sample size (all/those in child care): All families	101/75	147/111
Site 1	32/27	45/34
Site 2	22/14	30/23
Site 3	47/34	72/54

Substantial differences between families in the three communities participating in the evaluation were noted. These may help us understand differences in the patterns of participation and outcomes that families demonstrated. These differences include:

- Site 1 included a substantially greater percentage of teen parents than the other communities. Consistent with this difference, mothers there were significantly more likely than others still to be enrolled in high school, to live in three-generation families, and to have only one child.
- Site 1 had a significantly larger proportion of mothers who were Caucasian than the other communities.
- Site 1 mothers were significantly more likely than other mothers to rate their home environment very positively and to report that their health and their children's health were excellent.
- Site 2 mothers were significantly less likely to be very low income (i.e., incomes less than $15,000 per year) than others, but were significantly more likely to be receiving benefits from public programs, such as TANF.

We also tested the extent to which random assignment resulted in groups that were equivalent at the outset and whether attrition from the evaluation changed group equivalence because some families self-selected into the assessments whereas other families declined to be assessed or could not be located. Group differences include the following:

- In Site 1, participant group mothers who took part in the first assessment were more likely than control group mothers to be Caucasian.
- Participant group mothers in the overall sample were significantly more likely than controls to have more than one child at the time of the first assessment.
- Site 2 mothers in the participant group were significantly more likely to have more than one child both at enrollment and at the first assessment.
- In Site 3, participant group mothers consistently rated their own knowledge of infants more highly than did control group mothers.

These factors are taken into account in interpreting findings regarding participation differences between communities that are reported in Chapter 3 and in analyzing the outcomes we report for parents and children in Chapters 4 and 5.

3 PAT PROGRAM PARTICIPATION

Issues surrounding program recruitment, engagement, and retention are central to questions of the effectiveness of home visiting programs. Parenting behavior and child development are unlikely to improve through involvement with a home visiting program if families drop out early, do not receive the level of service that is expected to make a difference, or are not truly engaged with the program's information or activities. Yet, traditionally, home visiting programs, as well as other social service programs, have had difficulty with just these issues. A recent review of evaluations of well-known home visiting programs concluded, "all of the home visiting programs…struggled to enroll, involve, and retain families in home visiting services…. The consistency with which this occurs across the models suggests that this is a real phenomenon in the implementation of home visiting programs, not just the result of poor implementation of particular program models or special program sites" (Gomby et al., 1999, p. 16).

In the context of the PAT Multisite Evaluation, issues of engagement have proven to be so challenging that the study focus was shifted midstream to give greater attention to understanding the difficulties local programs were having in engaging and retaining families. Quantitative data on parent engagement through children's first birthdays were combined with qualitative data from focus groups with parent educators and parents in each community and from observations of home visits to look in depth at issues of engagement. Findings from this analysis are reported in *Parental Engagement in Home Visiting Programs—Findings from the Parents as Teachers Multisite Evaluation* (Wagner, Spiker, Gerlach-Downie, and Hernandez, 2000).*

In this chapter, we extend elements of that analysis by describing the pattern of engagement of Multisite Evaluation participant group families through children's second birthdays. Underlying these analyses is the notion that engagement in PAT is a multidimensional concept. Often, research on program participation has focused only on enrollment status—dropping out or persisting. Our analyses have attempted to illuminate the greater complexity of the engagement issue; here, we address the engagement involved in "saying yes" to home visits, "being there" for the visits, "being involved" in the visits, and "doing the homework" involved in following parent educators' suggestions for activities and behaviors between visits.

We first consider "say yes" engagement by looking at the ways in which local programs recruited families, which in at least two of the three communities generated a somewhat different clientele than was usually served, with significant implications for engagement and retention, in the view of those programs. We also consider the point at which "say yes" becomes "say no," and families drop out of the program; we examine the number of families who began services but discontinued them early, the timing of the dropout decision, and the reported reason for that decision. We then consider "be there" engagement by examining the number of home visits received by participant group families who actually began their home visits. "Be involved" engagement is addressed by using parent educators' ratings of families' participation during home visits. We conclude the chapter by addressing the issue of whether some kinds of families

* This report is available at www.sri.com/policy/cehs/publications/humpub/engage1.pdf.

were more likely to participate in PAT, as indicated by the duration and intensity of their participation and their engagement in home visits.

Recruiting Families

Staff of the local PAT programs participating in the evaluation recruited families for the study. Whereas many PAT programs traditionally are able to keep their home visit caseloads full with families that initiate contact with the programs and seek services, the Multisite Evaluation was not the typical PAT enrollment experience. Although the evaluation involves ongoing local programs that operate as closely as possible to routine procedures, it became clear quite early in the evaluation that the very fact that local programs were part of the evaluation significantly altered the normal enrollment process, with important implications for program participation.

The fact that the evaluation employed an experimental design with random assignment to participant and control groups required that a larger than normal group of families be recruited. Only 40% of families would actually be assigned to receive home visits, enough to fill the usual caseloads of the parent educators in the programs. However, 60% would be assigned to a control group, which would receive free child assessments annually and free children's books several times a year, but would not receive home visits or parenting information. Thus, in order to have sufficient families for both the participant and control groups, programs were asked to recruit 250% of the families they normally would recruit and actually could serve. Although participating programs felt confident that they could meet the recruitment goal, doing so was more difficult than expected, and it required recruitment activities that were beyond their usual mode of operation. In fact, the recruitment period was extended in every site, yet only one site met the goal of recruiting 225 to 250 families (Site 2, with 247 families). Sites 1 and 3 recruited 206 and 214 families, respectively.

Several differences from routine recruitment procedures were apparent as local programs enrolled families for the study. Differences focused on the following factors.

Recruitment as a new activity. Under normal operations, most new families who enroll in PAT initiate contact with the program. In fact, some programs have a waiting list of families, so that any opening in a parent educator's caseload is filled promptly with a family who sought out the program. Self-referral and taking families from a waiting list were not sufficient, however, to generate the larger number of families required by the evaluation design. Active recruitment was undertaken as a fairly new activity by two of the three local PAT programs.

New locations and mechanisms. All programs recruited through new mechanisms and at new locations to some extent. Doing so was particularly necessary because of the intent of the evaluation to assess the impacts of PAT for low-income families. Table 3-1 indicates the sources from which families were recruited. The office of the Supplemental Feeding Program for

Table 3-1
RECRUITMENT SOURCES OF PARTICIPANT GROUP FAMILIES, BY SITE

	All Families	Site 1	Site 2	Site 3
Percentage recruited from:				
WIC office	42.4	3.7	56.4	72.6
Doctor, hospital, clinic	21.4	53.7	2.1	8.1
Word of mouth	9.2	19.5	3.2	4.8
Self-referral	2.9	4.9	2.1	1.6
Other	24.0	18.3	36.2	12.9
Sample size	238	82	94	62

Women, Infants, and Children (WIC) was the most productive source of recruits (42%). Because WIC serves primarily low-income mothers and young children, it was a logical source of appropriate families. Medical offices, word of mouth, and self-referral, which are sources of the vast majority of newly enrolled families under typical circumstances, were much less common recruitment sources for the evaluation. The exception to this pattern is Site 1, whose staff reported that recruitment activities for the evaluation substantially paralleled those used under their normal operating conditions, despite the considerably larger number of new enrollees needed for the evaluation.

New recruitment procedures. One important difference in recruitment procedures involved the person who was assigned responsibility for recruitment. Under normal conditions, the person a family first encounters in seeking information about PAT also is the parent educator who provides that family with home visits. However, the more intensive recruitment required for the evaluation prompted local programs to hire or reallocate work to free up staff to work exclusively on recruitment. Thus, the staff member families met as they were recruited often was not the person who contacted them to arrange for their first home visit. Another procedural difference involved the timing of recruitment. In at least two communities, there was a substantial time lag between recruitment and the first home visit, due to school-year calendars and other factors. Given the high mobility of some families, many families could not be reached for the first visit at the address or telephone number they had given at enrollment. Further, the hiatus between recruitment and the first visit reportedly dampened the enthusiasm of some parents to receive home visits.

Mixed program message. Normally, families who enroll in PAT do so because they are interested in receiving home visits. Undoubtedly, many of the parents who enrolled in the evaluation also were interested in receiving home visits. However, this was only one of two program options presented to them. PAT recruiters explained that the program involved two groups—one would receive regular home visits and parenting education and regular child assessments, and one would receive annual child assessments and free children's books several times a year. Some families might have enrolled because they were as interested, or even more interested, in free assessments and children's books, rather than home visits and parenting education.

The result of recruiting families under atypical conditions and in atypical locations when the precise nature of the program and the expected commitment of parents to it may have been

unclear was that families were recruited who had different characteristics than those typically served. (The characteristics of enrolled families were described in Chapter 2.) Recruitment differences also resulted in enrolling families who were substantially less motivated to participate than typical PAT families, according to program staff in two of the three sites.

Duration of Participation

Retaining families in home visiting programs is not a new problem. Reviewing a set of well-known national models, one finds that "between 20% and 67% of those families [who] enrolled...left the programs before the programs were scheduled to end. Indeed, these relatively low rates of engagement have been observed in studies of home visiting for years" (Gomby et al., 1999, p. 17).*

The local programs in the Multisite Evaluation were not immune to the challenges of engaging families. As mentioned above, the engagement problem may even have been exacerbated by the fact that families were recruited through new mechanisms associated with participation in the evaluation. Not only was it difficult to recruit families, but once recruited and assigned to the participant group, many families chose not to begin services. Table 3-2 demonstrates that, overall, more than one in five families who responded positively to the initial enrollment invitation did not follow through and begin home visits when they were assigned to the participant group. Almost 35% of families began home visits but discontinued them before children were 2 years old. The dropout rate was almost twice as high between children's first and second birthdays (23%) as before first birthdays (12%). About 44% of families were still participating as of their children's second birthdays.

Table 3-2
PARTICIPATION STATUS OF PARTICIPANT GROUP FAMILIES, BY SITE

	All Families	Site 1	Site 2	Site 3
Percentage who:				
Never began home visits	21.7	3.7	26.0	33.0
Began home visits, but dropped out by child's first birthday	11.8	11.0	5.2	19.2
Began home visits, but dropped out between child's first and second birthdays	22.8	17.1	33.3	17.0
Persisted with home visits through second birthdays	43.8	68.3	35.4	30.8
Sample size	272	82	96	94

* Gomby cites Halpern (1990) and Gray and Wandersman (1980) in support of this statement.

There were marked differences between sites in patterns of participation. Site 1, whose recruitment process substantially mirrored their typical process, had very few families (4%) who did not begin home visits, and 68% still were receiving them at their children's second birthdays. In contrast, one-third of participant group families in Site 3 never began home visits, and only 31% still were participating at children's second birthdays. Site 2 also experienced a fairly high incidence of enrolled families who did not begin home visits (26%), and 35% of families persisted in their participation through second birthdays. In Site 3, recruitment was conducted in previously unserved geographic areas, and in both Sites 2 and 3, a time lag between recruitment and the contact to arrange the first home visit occurred for many families. In fact, the average time lag between enrollment and the first home visit for those who ever began home visits was 1.3 months in Site 1, 2.8 months in Site 2, and 3.2 months in Site 3. However, it is unclear to what extent this time lag contributed to attrition because the time lag actually was longer for families who ultimately persisted through children's first birthdays (2.4 months, on average).

The site differences in engagement offer support for the conclusion that the new recruitment activities and procedures undertaken as a result of the evaluation, particularly in Sites 2 and 3, resulted in recruiting families who were less engaged in home visits than families who typically enroll in PAT. This perceived lower motivation is supported by reports of the primary reason families dropped out of PAT (see Table 3-3). In focus groups, parent educators contended that the primary reason their typical families dropped out was "because they move or because they outgrow the program." Other evaluations of PAT (Wagner et al., 1993; Wagner, Cameto, and Gerlach-Downie, 1996) also suggest that families' moving from the community is the most common reason for attrition. However, in the Multisite Evaluation, difficulty of contacting families (arguably reflecting a lack of interest in being contacted) and an explicit lack of interest in the program were the most commonly reported reasons for families' dropping out, accounting for 67% of dropouts. These reasons were less commonly cited in Site 1 than in the other communities; moving from the community was the most frequently noted reason for attrition in Site 1, as is more traditional for PAT programs.

Table 3-3
REASONS FOR PARTICIPANT GROUP FAMILIES' DROPPING OUT OF PAT

	All Families	Site 1	Site 2	Site 3
Percentage of program dropouts reporting reason for dropping out as:				
Difficult to contact; doesn't keep appointments	46.8	26.7	50.8	51.4
Moved from the community	23.1	43.3	17.9	19.4
No longer interested	20.1	16.7	23.9	18.1
Personal problems	4.1	10.0	1.5	4.2
Went to work or back to school	2.0	.0	4.5	2.8
Temporarily out of the area	1.8	3.3	1.5	1.4
Family member objects to participation	1.2	.0	.0	2.8
Sample size	153	26	62	65

Families who began services remained active participants for different lengths of time, thus being exposed to different amounts of program information, potentially a key factor influencing the outcomes they achieved.* To examine duration of program participation, it was necessary to develop a uniform definition of the "drop date" for each dropout family. As part of the evaluation, program staff were encouraged to retain as many program families as possible. Therefore, parent educators were reluctant to drop families, even after no contact had been made for several months. As a result, program staff retained families on the program rolls for extended periods without service. Thus, the official drop date often was not a good reflection of the actual length of active participation. For this reason, we computed an outer bound to the drop date, which was 3 months after the last home visit. This truncates the months enrolled for all dropouts after 3 months without service. However, regardless of the number of months spent without service, families were not considered dropouts if they returned to the program and received home visits again any time before the enrolled children's second birthdays.

Table 3-4 presents the length of time that families who began home visits were active in the program. Duration of participation is presented first for all enrolled families, regardless of their participation status at the conclusion of the evaluation period. This average duration of participation for all families is one important view, because both dropouts and persisters were included among those who were assessed. However, they had quite different patterns of participation. Therefore, Table 3-4 also presents the duration of participation for those who persisted through first and through second birthdays and for those who dropped out before the first birthday and between the first and second birthdays.

On average, participants were active in the program for just over 14 months until children's second birthdays. The majority were active 16 or fewer months, with almost one-fourth remaining in the program 21 months or more through children's second birthdays. Families in Site 1 had the longest average period of participation (17 months) relative to other sites (just over 13 and 11 months for Sites 2 and 3, respectively, $p<.001$). The majority of families in Site 1 had been in the program 17 months or longer through children's second birthdays.

Among persisters, those who remained in the program at least through children's first birthdays averaged almost 9 months of participation up to that time, whereas those who remained in the program through second birthdays averaged more than 18 months of participation. Again, figures were somewhat higher in Site 1 than in the other sites, particularly for those who remained in the program through second birthdays (almost 20 months vs. fewer than 17, $p<.001$).

Dropouts who began home visits but left the program before children were a year old averaged just under 5 months of participation before dropping out. Those who left the program between first and second birthdays averaged 11 months of participation. Dropouts in Site 1 averaged about the same length of participation before dropping out as families in Site 2 and marginally more than those in Site 3.

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* Local PAT programs typically include among their services developmental screenings of children's hearing and vision; these typically are conducted every 6 months. Thus, children of families who participated for a longer period would have garnered more of the benefits of the screenings (the actual number of screenings conducted was not measured in the evaluation).

Table 3-4
MONTHS PARTICIPATING, BY PARTICIPATION STATUS

	All Families	Site 1	Site 2	Site 3
All Families with Home Visits				
Average months participating	14.1	17.1	13.3	11.2
Percentage participating				
12 or fewer months	34.8	18.9	38.8	50.9
13 to 16 months	24.8	20.3	29.8	24.6
17 to 20 months	17.2	20.3	16.4	14.0
21 or more months	23.2	40.5	14.9	10.5
Program Persisters through First Birthday				
Average months participating	8.6	9.0	7.8	8.6
Percentage participating				
6 or fewer months	33.0	29.0	43.2	30.3
7 to 9 months	22.4	15.8	31.8	22.7
10 to 12 months	35.2	44.9	11.4	40.9
13 or more months	9.5	10.1	13.6	6.1
Program Persisters through Second Birthday				
Average months participating	18.2	19.8	16.9	16.6
Percentage participating				
12 or fewer months	8.6	.0	12.1	21.4
13 to 16 months	27.4	23.2	33.3	28.6
17 to 20 months	26.5	23.2	30.3	28.6
21 or more months	37.6	53.6	24.2	21.4
Program Dropouts by First Birthday				
Average months participating	4.9	5.9	4.0	5.2
Percentage participating:				
6 or fewer months	76.9	53.8	79.6	82.8
7 to 9 months	19.8	38.5	16.3	17.2
10 to 12 months	2.2	7.7	2.0	.0
13 or more months	1.1	.0	2.0	.0
Program Dropouts between First and Second Birthdays				
Average months participating	11.2	12.0	11.8	9.3
Percentage participating:				
12 or fewer months	53.2	55.6	53.8	50.0
13 to 16 months	36.2	22.2	34.6	50.0
17 to 20 months	6.4	22.2	3.8	.0
21 or more months	4.3	.0	7.7	.0
Sample size: All families	198	74	67	57
Persisters (through first/first to second birthday)	179/117	69/56	44/33	66/28
Dropouts (by first/first to second birthday)	89/47	13/9	47/26	29/12

Months participating is calculated as the number of months from the date of the first home visit to the designated birthday for persisters or, for dropouts, to either the "drop date" designated by PAT program staff or to a date 3 months after the last home visit (please see discussion in the text of the designated "drop date"). Families who participated in no home visits are not included in these calculations.

Amount and Intensity of Services

Given this duration of participation, an important question concerns the amount of service families received while they participated, which is at the heart of the "be there" dimension of engagement. To address questions of service amount and intensity, we examined the actual number of home visits each participating family received, as a measure of their overall "dose" of the intervention. We also calculated the ratio of visits to months participating,* which is a measure of the intensity of services received during the time participants were active in the program. Thus, a mother who received monthly home visits for 1 year received a high intensity of services during her participation (a ratio of 1.0, or one visit for each month enrolled).

The average number of home visits and the average ratio of both home visits and cancellations/"no shows" to months participating are displayed in Table 3-5 for all families who began home visits and for dropouts and persisters.** Overall, participant group members received an average of almost 10 home visits. Almost 1 in 5 families had only 1 or 2 home visits, but 26% had 16 or more. The average number of home visits was significantly higher in Site 1 (14) than in Sites 2 and 3 (9 and 5, $p<.001$). Some of this difference would be expected from the fact that families in Site 1 averaged a somewhat longer participation period in which to have home visits. However, we also see that the ratio of home visits to months participating was significantly higher in Site 1 (.69 vs. .49 and .32; $p<.001$), indicating a greater intensity of service as well as a greater duration of participation. Almost 15% of families in Site 1 received home visits at least monthly (a ratio of 1.0 or higher), compared with 8% and none in Sites 2 and 3 (n.s. and $p<.001$, respectively). Site 1 also had significantly fewer cancellations and "no shows" for scheduled home visits. The ratio of cancellations/"no shows" to home visits delivered was .33 in Site 1 (i.e., one home visit was cancelled for every three that were delivered), compared with .46 ($p<.05$) and .62 ($p<.001$) in Sites 2 and 3.

The average dose and intensity of services for participants overall are suppressed by the lower levels of participation among families who eventually dropped out of the program. Persisters who stayed in the PAT program until children were 2 years old received an average of 13 home visits, significantly more than the average of 2 visits received by those who dropped out in the first year and 6 for those dropping out between children's first and second birthdays. Moreover, the mean ratio of home visits to months enrolled was significantly higher for persisters (.70 vs. .29 and .35, $p<.001$). The ratio of cancellations/"no shows" to home visits delivered was higher for dropouts (.60 vs. .24, $p<.001$). These differences suggest that the parents who eventually dropped out participated in home visits less intensely while they were active enrollees than did those who persisted in the program.

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* The participation period begins in the month of the first visit, which, in some cases, was several months after the initial enrollment.

** Many local PAT programs also include group meetings for parents and/or play groups for children as part of their services. These activities were not offered consistently across the sites in the evaluation or over time, and attendance at such group events was not measured as part of the study.

Table 3-5
HOME VISIT PARTICIPATION, BY PARTICIPATION STATUS

	All Families	Site 1	Site 2	Site 3
All Families with Home Visits				
Average number of home visits during total enrollment period	9.5	13.6	8.6	5.2
Percentage with number of home visits				
1 or 2 visits	19.2	6.8	14.9	40.4
3 to 6 visits	22.2	10.8	26.9	31.6
7 to 10 visits	17.2	10.8	38.4	12.3
11 to 15 visits	15.7	24.3	11.9	8.8
16 to 20 visits	21.7	39.2	14.9	7.0
21 or more visits	4.0	8.1	3.0	.0
Average ratio of home visits to months participating*	.52	.69	.49	.32
Percentage with ratio of home visits to months participating*				
≤ .4	47.5	21.6	53.7	73.7
.41 to .99	44.4	64.5	38.7	26.3
1.0 or above	8.1	14.9	7.5	.0
Average ratio of cancellations/"no shows" to home visits completed	.43	.33	.46	.62
Persisters				
Average total number of home visits				
Persisters through first birthday	5.5	7.0	5.0	3.6
Persisters through second birthday	12.9	16.3	10.9	8.5
Percentage with number of home visits				
Persisters through first birthday				
1 or 2 visits	18.2	6.2	20.4	37.1
3 to 6 visits	44.8	35.4	53.7	48.6
7 or more visits	37.0	58.5	25.9	14.3
Persisters through second birthday				
10 or fewer visits	37.6	10.7	57.6	67.9
11 to 14 visits	17.1	17.9	15.2	17.9
15 to 18 visits	23.1	33.9	12.1	14.3
19 or more visits	22.2	37.5	15.2	.0
Sample size: All families[1]	198	74	67	57
Persisters through first/second birthdays	154/117	65/56	54/33	35/28

[1] Families with child's birthday specified and home visit records completed and participating in at least one visit.
Months participating is defined as the number of months between the first visit and the identified birthday.

Table 3-5
HOME VISIT PARTICIPATION, BY PARTICIPATION STATUS (Concluded)

	All Families	Site 1	Site 2	Site 3
Persisters (Continued)				
Average ratio of total home visits to months participating*				
Persisters through first birthday	.90	.92	.89	.87
Persisters through second birthday	.70	.83	.62	.53
Percentage with ratio of total home visits to months enrolled				
Persisters through first birthday				
≤ .4	11.1	4.6	13.2	20.0
.41 to .99	34.6	40.0	30.2	31.4
1.0 or above	54.2	55.4	56.6	48.6
Persisters through second birthday				
≤ .4	22.2	3.6	33.3	46.4
.41 to .99	65.0	76.8	54.6	53.6
1.0 or above	12.8	19.6	12.1	.0
Average ratio of cancellations/"no shows" to home visits completed	.24	.18	.27	.32
Dropouts				
Average total home visits				
Dropouts by first birthday	2.2	--	--	1.6
Dropouts in second year	6.3	--	7.4	--
Percentage with total number of home visits				
Dropouts by first birthday				
1 or 2 visits	62.9	--	--	82.4
3 to 6 visits	34.3	--	--	17.6
7 or more visits	37.0	--	--	14.3
Dropouts in second year				
1 or 2 visits	21.3	--	11.5	--
3 or 4 visits	25.5	--	30.8	--
5 or 6 visits	12.8	--	7.7	--
7 or more visits	40.4	--	50.0	--
Average ratio of total home visits to months enrolled				
Dropouts by first birthday	.29	--	--	.22
Dropouts in second year	.35	--	.42	--
Percentage with ratio of home visits to months enrolled				
Dropouts by first birthday				
≤ .4	80.0	--	--	100.0
.41 to .99	17.1	--	--	.0
1.0 or more	2.9	--	--	.0
Dropouts in second year				
≤ .4	72.3	--	65.4	--
.41 to .99	25.5	--	30.8	--
1.0 or more	2.1	--	3.8	--
Average ratio of cancellations/"no shows" to home visits completed	.60	--	.53	--
Sample size[1]: Dropouts by first/first to second birthdays	33/47	9/9	9/26	15/12
Persisters through first/second birthdays	154/117	65/56	54/33	35/28

[1] Dropouts by first birthdays are families with child's birthday specified, a home visit record completed, at least one home visit before the first birthdays, but not considered by the program as still active at the first birthday. Dropouts in the second year are families with child's birthday specified, a home visit record completed, at least one home visit between the first and second birthdays, but not considered by the program as still active at the second birthday.
--Too few cases to report separately.

The site differences in the number and intensity of services for all families were reflected in patterns of participation for both persisters and dropouts. Site 1 delivered significantly more intense home visiting services to both persisters and dropouts and had a significantly lower ratio of cancellations/"no shows" to home visits delivered than did the other programs.

Another element of intensity of services involves the extent to which parent educators referred families to other service agencies in their communities. Table 3-6 indicates that families were given an average of one referral by a parent educator, which involved 44% of families. Referrals were most common in Site 1 and least common in Site 3 for families overall (1.8 vs. .8 and .4, $p<.001$). Site 1 also gave referrals to more families (68% vs. 42% and 24%, $p<.001$). Persisters averaged more referrals, 1.6, given their longer participation period. Site 1 families who persisted through second birthdays received significantly more referrals than other families (2.4 vs. about 1, $p<.001$), and more families received referrals (86% vs. 56% and 52%, $p<.01$). Referrals to dropouts were uncommon, averaging only .4, with no significant differences between sites.

Referrals do not correlate directly with contacts between families and community agencies. Findings reported earlier (see Table 2-11) show that families in Site 1 had slightly fewer agency contacts than referrals, whereas families in Site 3 had more than four times as many agency contacts as referrals, indicating that they took the initiative to contact some agencies, beyond those to which they were referred by parent educators. Site 2 families also had many more contacts than referrals. This pattern may reflect the fact that some of the social service agencies that sponsored PAT in that site provided services directly to their families, potentially reducing the need to refer them to outside agencies.

Referrals to children's enrichment activities were the most common type of referrals made (13%), followed by medical services, local activities (e.g., the zoo, a museum), and preschools. Staff in Site 1 were more likely than those in the other sites to refer families to most kinds of agencies, with the exceptions that child screening and financial services referrals were marginally more common in Site 2 than at the other two sites, and referrals to school or district activities were most common in Site 3, where families were encouraged to take part in activities sponsored by the school district that also sponsored the PAT program.

Table 3-6
REFERRALS TO OUTSIDE AGENCIES MADE DURING HOME VISITS

	All Families	Site 1	Site 2	Site 3
All Families with Home Visits				
Average number of referrals made to a family	1.0	1.8	.8	.4
Percentage of families referred to:				
Any service	43.7	67.9	41.7	24.2
Children's enrichment activities	13.1	28.4	11.5	1.1
Local activities (e.g., zoo, museum)	11.9	34.6	3.1	1.1
Medical services (e.g., clinic, health dept.)	11.9	25.9	6.2	5.5
Preschool	10.8	18.5	10.4	4.4
Adult/continuing education	9.7	13.6	13.5	2.2
Library	8.6	25.9	2.1	.0
Local vendors	8.6	17.3	5.2	4.4
Child screening	7.5	7.4	11.5	3.3
Financial services (e.g., TANF)	6.0	8.6	9.4	.0
Crisis intervention (e.g., substance abuse treatment, child protective services)	3.0	4.9	3.1	1.1
School/district activities	4.1	.0	.0	12.1
Persisters				
Average number of referrals made to a family	1.6	2.4	1.0	.9
Percentage of families referred to:				
Any service	68.9	85.7	55.9	51.7
Children's enrichment activities	26.9	41.1	23.5	3.4
Local activities (e.g., zoo, museum)	24.4	46.4	5.9	3.4
Medical services (e.g., clinic, health dept.)	18.5	30.4	5.9	10.3
Preschool	17.6	26.8	8.8	10.3
Adult/continuing education	13.4	16.1	17.6	3.4
Library	17.6	33.9	5.9	.0
Local vendors	11.8	19.6	5.9	3.4
Child screening	12.6	10.7	17.6	10.3
Financial services (e.g., TANF)	6.7	10.7	5.9	.0
Crisis intervention (e.g., substance abuse treatment, child protective services)	5.9	7.1	5.9	3.4
School/district activities	8.4	.0	.0	34.5
Dropouts				
Average number of referrals made to a family	.4	.6	.6	.1
Percentage of families referred to:				
Any service	23.5	28.0	33.9	11.3
Children's enrichment activities	2.0	.0	4.8	.0
Local activities (e.g., zoo, museum)	2.0	8.0	1.6	.0
Medical services (e.g., clinic, health dept.)	6.7	16.0	6.4	3.2
Preschool	5.4	.0	11.3	1.6
Adult/continuing education	6.7	8.0	11.3*	1.6
Library	1.3	8.0	.0	.0
Local vendors	6.0	12.0	4.8	4.8
Child screening	3.4	.0	8.1	.0
Financial services (e.g., TANF)	5.4	4.0	11.3	.0
Crisis intervention (e.g., substance abuse treatment, child protective services)	.7	.0	1.6	.0
School/district activities	.7	.0	.0	1.6
Sample size: All families	268	81	96	91
Persisters	119	56	34	29
Dropouts	149	25	62	62

Table 3-7 shows that parent educators generally gave high marks to families on the several dimensions of engagement, with scores averaging just over 5 on a 7-point scale for participating families at children's first birthdays and 5.5 at second birthdays. Average scores for all participants ranged from 4.3 to 5.6 across dimensions. The highest scores were given for parents' listening to their parent educators and for overall participation. In contrast, parents were rated less highly on asking for advice and asking questions, dimensions that required more parental initiative. Almost three-fourths of families had more than one adult attending at least one home visit during their PAT participation. All measures were somewhat higher at the second measurement than at the first. This may reflect the fact that only those who remained in the program past children's first birthdays were given engagement ratings, and those families may have been more actively engaged than families who were active only at the second assessment in their children's first year.

Those who eventually dropped out were given significantly lower average involvement scores than persisters on most dimensions at both points in time (e.g., overall scores of 3.4 and 4.5 for dropouts, compared with 5.5 and 5.8 for persisters through first and second birthdays, $p<.001$), suggesting that lower engagement was a precursor to families' eventually leaving the program altogether.

Site differences were quite noticeable. Consistent with other aspects of participation, engagement was rated considerably higher on most dimensions in Site 1 than in Sites 2 and 3 for all enrolled families and for persisters.

Table 3-7
ENGAGEMENT DURING HOME VISITS, BY PARTICIPATION STATUS AND SITE

Average Engagement Score	All Families	Site 1	Site 2	Site 3
All Participants				
Overall engagement				
Through first birthday	5.1	5.7	4.9	4.5
First to second birthday	5.5	5.9	5.2	5.1
Parent listens to PE during visits				
Through first birthday	5.4	5.7	5.2	5.3
First to second birthday	5.6	5.8	5.4	5.6
Parent asks questions during visits				
Through first birthday	4.6	5.0	4.4	4.3
First to second birthday	4.9	5.2	4.6	4.8
Parent asks for advice during visits				
Through first birthday	4.3	4.6	4.3	4.0
First to second birthday	4.5	4.7	4.3	4.5
Percentage with more than one adult participant in at least one home visit				
Through first birthday	72.7	75.7	77.8	64.4
First to second birthday	79.4	79.4	81.4	76.3

Table 3-7
ENGAGEMENT DURING HOME VISITS, BY PARTICIPATION STATUS AND SITE (Concluded)

Average Engagement Score	All Families	Site 1	Site 2	Site 3
Persisters				
Overall engagement				
Through first birthday	5.5	5.9	5.3	5.2
First to second birthday	5.8	6.1*	5.8	5.4
Parent listens to PE during visits				
Through first birthday	5.7	5.8	5.5	5.8
First to second birthday	5.8	5.9	5.7	5.6
Parent asks questions during visits				
Through first birthday	5.0	5.2	4.7	4.9
First to second birthday	5.2	5.4	5.0	4.9
Parent asks for advice during visits				
Through first birthday	4.6	4.7	4.5	4.6
First to second birthday	4.7	4.9	4.4	4.5
Percentage with more than one adult participant in at least one home visit				
Through first birthday	78.7	79.4	81.5	72.7
First to second birthday	81.7	80.0	81.2	85.7
Dropouts				
Overall engagement				
Through first birthday	3.4	3.8	3.8	2.9
First to second birthday	4.5	--	4.6	4.3
Parent listens to PE during visits				
Through first birthday	4.4	4.5	4.4	4.3
First to second birthday	5.1	--	5.0	--
Parent asks questions during visits				
Through first birthday	3.4	3.6	4.0	2.9
First to second birthday	4.2	--	4.2	--
Parent asks for advice during visits				
Through first birthday	3.3	3.3	4.3	2.7
First to second birthday	4.1	--	4.2	--
Percentage with more than one adult participant in at least one home visit				
Through first birthday	48.4	42.9	55.6	46.7
First to second birthday	73.3	--	81.5	--
Sample size: All families with home visits	184	70	66	48
Persisters through first/second birthdays	150/160	63/63	/59	/38
Dropouts by first/second birthday	32/45	7/8	54/27	33/10

Who Engaged in Home Visits?

In this section, we explore the characteristics of parents that were related to the levels and types of engagement they demonstrated. Understanding the characteristics of parents that relate to engagement can help PAT staff identify those who are likely to need extra effort to remain with and actively participate in their home visits. It also potentially can help explain some of the site differences we see in patterns of participation. First, we consider a variety of demographic factors as they related to three dimensions of engagement: persisting through second birthdays, intensity of service while enrolled, and ratings of overall engagement. We also explore the hypothesis that levels of engagement were influenced by a variety of potential barriers to engagement parents may have experienced.

Demographic Characteristics

We have explored the question of whether parents who were distinguished by specific demographic characteristics may have been more or less likely to demonstrate the various dimensions of engagement in PAT home visits. For example, parent educators often contend that teenage parents are more difficult to engage than older parents. Were there other demographic characteristics that were related to engagement? Did different parent characteristics relate to different kinds of engagement?

Table 3-8* depicts the relationship between three dimensions of engagement and mother's age, ethnicity, and education, and household socioeconomic status. We see several factors that related strongly and similarly to all three dimensions of engagement. Specifically, mothers who were older and Caucasian and who had higher incomes and were not receiving TANF benefits were significantly more likely to persist in the program, receive a greater number of home visits, and be rated more highly on general engagement in the home visits by their parent educator. Being better educated also related to better participation and engagement, with the relationship reaching statistical significance in the case of persisting in the program and parent educator engagement ratings. The information-seeking behavior regarding children and parenting and self-reported knowledge of infants were not related to these dimensions of engagement.

Potential Barriers to Engagement

In addition to demographic factors, we investigated whether parents who were more engaged in PAT could participate because they were less likely to experience potential barriers to engagement posed by such circumstances as single parenthood, parenting multiple children, going to school, working, having a chaotic home environment, being in poor health, or having a child in poor health.

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* These analyses were conducted for all study participants as a whole, not for individual sites, because we do not expect the relationship between participant characteristics and engagement to vary by site and because some of the subgroups we examined were too small to be further disaggregated by site.

Table 3-8
DIMENSIONS OF ENGAGEMENT IN HOME VISITS, BY DEMOGRAPHIC CHARACTERISTICS AT ENROLLMENT

	Percentage Who Persisted through Second Birthdays	Sample Size	Average Ratio of Home Visits to Months Participating	Sample Size	Average Parent Educator Rating of Overall Engagement	Sample Size
Mother's age						
Less than 20	**34.3****	67	**.48**	52	**4.4**	49
20 to 29	**42.6***	148	**.48**	100	**4.6**	95
30 or older	**61.1**	54	**.66****	44	**5.9*****	43
Mother's ethnicity						
Caucasian/white	**59.3*****	81	**.65**	65	**5.7**	64
African-American	**35.7**	154	**.46****	101	**4.4*****	97
Hispanic/Asian/Other	43.2	37	**.43****	32	**4.9***	28
Mother's education						
Less than high school	**35.0**	97	.49	71	**4.3**	69
Some postsecondary education	**51.2***	127	.56	93	**5.3*****	89
Annual income						
Less than $15,000	**39.5**	152	**.45****	111	**4.2*****	106
$15,000 to $39,999	**39.5**	81	**.55****	51	**5.2**	48
$40,000 or more	**79.4*****	34	**.73**	32	**6.3**	31
Receives TANF						
Yes	**29.8**	47	**.43**	36	**4.2**	35
No	**47.9***	213	**.55***	153	**5.0***	145
Mother's information-seeking behavior regarding children and parenting						
High	46.8	62	.55	46	5.1	43
Medium	46.0	124	.55	88	4.8	84
Low	38.6	83	.46	61	4.7	59
Mother's rating of her knowledge of infants						
High	40.5	126	.47	90	4.7	85
Little/some/fairly good	46.5	142	.56	104	5.0	100

Bold type indicates moderate and large effects. Significantly different in a two-tailed test at the following levels: * p<.05; ** p<.01; *** p<.001.

In focus groups and interviews, some parent educators described these factors as significant barriers for some families. One parent educator reported that visiting a mother in the study was extremely difficult because she was "very busy working and going to school." Another parent educator explained that she did not do home visits at night in dangerous neighborhoods, which made it very difficult to visit some families with parents who worked during the daytime. Another parent educator echoed similar experiences:

> *"There are some dropouts who do have a history of being engaged and of having some good solid home visits, and then something changes. They get a job. When you're working 40 hours a week and you're by yourself, it just doesn't fit in the picture any more. It's just not realistic. I definitely see that as a pattern. Even when you say you will come in the evenings, evenings are lousy times to have home visits. And Saturdays sometimes aren't any better because they're busy."*

The stresses of poverty are another potential barrier to engagement.

> *"I don't care who you are, if the lights are out or the heat is off, nobody cares nothing about child development."*

Another potential barrier to engagement, particularly among high-needs families, involves a lack of stability in the home environment.

> *"I think there has to be a degree of stability, not only in where they live but in their lives."*

> *"It [keeping appointments] reflects more how chaotic their lifestyles are.... High-needs families are just more distracted because they have so many other issues going on. When they are going through this chaos, they don't have time for us."*

Table 3-9 reveals the relationships between aspects of engagement and these potential barriers. Again, many factors related consistently to all three dimensions of engagement. Being a single parent was negatively related to these measures of participation and engagement. In contrast, being in postsecondary school was positively related to persisting in the program, having more home visits, and being engaged in those visits. Being in school, rather than being a barrier to engagement, seems to have facilitated parent involvement. A similar finding is apparent regarding working. Those in job training or seeking work were least likely to score highly on these dimensions, significantly so in the case of ratio of visits received to months enrolled and parent educator ratings of engagement. The mother's having excellent health was related to stronger participation and engagement, significantly so in the cases of persistence and the number of home visits received. Children's health was inconsistently related to these factors, and mother's ratings of the level of stress in the home environment did not relate to participation and engagement, somewhat surprisingly.

Table 3-9
DIMENSIONS OF ENGAGEMENT IN HOME VISITS, BY POTENTIAL BARRIERS TO PARTICIPATION

Characteristics at Enrollment	Percentage Who Persisted through Second Birthdays	Sample Size	Average Ratio of Home Visits to Months Participating	Sample Size	Average Parent Educator Rating of Overall Engagement	Sample Size
Single parent						
Yes	**37.3**	134	**.44**	98	**4.3**	94
No	**51.1***	135	**.61*****	97	**5.4*****	92
Pregnant						
Yes	46.2	39	.45	28	4.9	26
No	43.7	231	.53	168	4.6	161
Child has siblings						
Yes	**36.7***	120	**.44**	81	**4.4**	77
No	**50.3**	149	**.58****	114	**5.1***	109
In postsecondary school						
Yes	**51.6**	117	**.56**	93	**5.3**	88
No	**35.0****	126	**.45***	84	**4.4****	81
Employment status						
Working full-time	43.6	62	**.50**	42	**5.2*****	38
Working part-time	45.4	33	**.51**	26	**4.8***	24
Job training or seeking work	25.9	27	**.32*****	21	**3.6**	21
Not working	42.5	113	**.53**	81	**4.8****	78
Household environment rating						
High (most positive)			.55	71	4.7	68
Low (least positive)			.46	40	4.6	38
Mother's report of social support						
High (most positive)	59.4	32	.65	25	**4.7**	68
Low (least positive)	60.0	35	.73	27	**5.7****	38
Reported health						
Mother						
Excellent	**53.6**	138	**.60*****	103	5.1	97
Very good	**35.7***	70	**.42**	52	4.5	50
Good/fair/poor	**32.3****	62	**.44**	41	4.7	40
Child						
Excellent	46.9	162	**.57**	119	5.0	112
Very good	37.5	40	**.38*****	32	4.7	32
Good/fair/poor	30.3	33	**.54**	19	4.6	19

Bold type indicates moderate and large effects. Significantly different in a two-tailed test at the following levels: * p<.05; ** p<.01; *** p<.001.

Because many of these characteristics can be intertwined, we conducted a multivariate statistical analysis to disentangle the relationships between parent factors and engagement. This analysis identifies the impact of each factor in the analysis on the engagement dimensions considered here, holding constant differences between families on the other factors in the models. Table 3-10 presents the results of this analysis.

The variables included in this analysis did not explain a significant portion of the variation in the number of home visits received; that dimension of engagement appears to be unrelated to the factors investigated here. The potential barriers analyzed did relate more strongly to the other engagement measures. Specifically, the ethnic/racial background of the mother and her marital status were related significantly both to the number of home visits received and to parent educators' ratings of overall engagement. Apparently being African-American and, to a lesser extent, Hispanic or of other minority backgrounds entailed challenges to participation that were independent of the income of families and other factors. In addition, the health of mothers was positively associated with their likelihood of persisting in the program through children's second birthdays. Interestingly, although parent educators contended that the level of stability in the home was an important influence on engagement, the relationship between the home environment score and the three dimensions of engagement was inconsequential when other factors were controlled for in the analyses.

Table 3-10
IMPACTS OF INDIVIDUAL AND HOUSEHOLD CHARACTERISTICS ON PARTICIPATION AND ENGAGEMENT

	For Identified Difference in Individual/Household Characteristics, Resulting Change in:		
Individual/Household Characteristics	Likelihood of Being a Persister	Number of Home Visits Received	Rating of Overall Engagement
Mother's age (29 vs. 19)	1.3	-.0	.3
Mother was African-American (vs. Caucasian)	**-24.5***	-.1	**-.7***
Mother was Hispanic, Asian, or other background (vs. Caucasian)	-25.5	-.14	**-.9**
Mother was married (vs. other status)	**22.7***	.0	**.9***
Number of siblings (two vs. none)	-2.2	-.0	-.1
Mother working or going to school (vs. neither)	-1.9	-1	.2
Income (<$15,000 vs. ≥$40,000)	-.8	.2	.4
Mother's health (excellent vs. good)	**11.9***	.1	.1
Mother enrolled pregnant (vs. not pregnant)	13.0	-.1	-.1
Parent's home environment rating (21 vs. 18)	.10	.6	.1
Maternal social support (13 vs. 6)	-8.3	.0	-.0
Parent's information-seeking behavior about children and parenting (10 vs. 7)	7.9	.0	.1
Sample size	134	136	132
Significance of the model (R^2, e.s.)	p<.001 (NA)	e.s. (.04)	p<.001 (.26)

Bold type indicates moderate and large effects. Significantly different in a two-tailed test at the following level: * p<.05

Summary

The analyses presented here underscore the difficulties of engaging parents in home visiting programs. Among families enrolled in the PAT program in the three participating Multisite Evaluation communities, 22% never began home visits, and 35% discontinued their participation before children were 2 years old. Being difficult to contact or no longer interested was the reported reason for two-thirds of the families leaving the program early. Overall, 44% of enrolled families were still receiving home visits at children's second birthdays.

Families who began home visits averaged about 18 months of participation, during which they received an average of 9.5 home visits, or a ratio of home visits to months of participation of .52, about half the monthly visits attempted to be provided by the PAT programs. Of every 10 visits delivered, 4 scheduled visits were cancelled or parents failed to be home at the appointed time. Families received an average of one referral to an outside agency during their participation in the program, which involved 44% of families. Parent educators rated families' engagement in home visits quite positively, giving them an average score of more than 5 on a 7-point scale; higher scores were given for passive engagement, such as listening to the parent education, than to more active forms of involvement, such as asking for advice.

Families who persisted in the program through children's second birthdays received somewhat more home visits (an average of 13), more intense service (a visit-to-months-participating ratio of .70), and more referrals (an average of 1.6 referrals involving 69% of families). Families who continued in the program through children's second birthdays were rated more highly than others in terms of "be involved" engagement.

These issues of participation and engagement did not occur to the same extent among the communities. Families in Site 1 consistently demonstrated significantly higher participation and engagement than families in the other communities. Part of this difference may have related to differences in recruitment processes; that process in Site 1 was reported to have been quite typical of the process used to recruit families there, whereas the processes in the other two communities were quite atypical. Differences in participation between communities also appeared to relate to differences in the families they served.

Although a variety of related factors were associated with differences in engagement (e.g., mother's age, education, and marital status; household income; etc.), when the interrelationships were controlled in statistical analyses, only minority status and poor maternal health were found to be significant challenges to engagement, independent of other factors in the analyses. Of particular interest is the lack of relationship between some assumed barriers to participation and engagement measures. In focus groups, parent educators reported that activities like having a job and going to school were significant barriers to engagement, as was a general instability or "chaos" in the home. However, none of these factors were significantly related to engagement when other characteristics of parents were controlled for in multivariate analyses.

Issues of engaging parents in home visiting have taken center stage in efforts to strengthen the ability of PAT and similar programs to benefit families. For example, the Parents as Teachers National Center currently is engaged in a "quality standards" project to develop guidelines for program implementation that are expected to enhance the ability of local programs to reach, engage, and retain families.

4 PARENTING OUTCOMES

The PAT program intends to teach parents about child development and how they can promote the positive development of their children. However, the knowledge gains are only an interim outcome for the program. Greater knowledge is expected to result in improved parenting practices, which, in turn, ultimately are expected to support enhanced development of children. As a parent educator in one study site explained,

> *"I work mostly toward the parents because if I can impact a change with the parents, it's definitely going to affect the children, so I look at it primarily as working with the parents. If I'm effective with the parent..., the parent is going to be a more active parent and they're going to be more attuned and they're going to be talking to their child more and having stimulating toys and the right kinds of things for the child to be doing."*

This perspective demonstrates the emphasis on parents' behavior change as central to generating benefits for children. Another parent educator summarized her view this way: *"It's working for children if it's working for their parents."* To her, child benefits were considered automatic if benefits could be achieved among parents.

In this chapter, we examine the impact of PAT on this chain of parent outcomes: parents' knowledge of child development and parenting, attitudes toward parenting, and parenting behaviors in several domains. For each outcome measure, we compare the participant and control groups within the entire sample* at assessments conducted near children's first and second birthdays. Effect sizes are presented, which express the difference between groups as a proportion of the standard deviation of the combined groups.** We then address the important question of whether benefits of program participation differed for families of different income levels by comparing outcomes for families with very low incomes (self-reported to be less than $15,000) and those of more moderate incomes (self-reported to be $15,000 or higher). Because preceding chapters showed that families in the three sites had backgrounds and experiences that differed markedly in ways that could have influenced outcomes, we also compare participant and control groups separately for each of the sites. These comparisons identify the "main effects" of participating in PAT for families as a whole and for these key subgroups.

As an additional, confirming analysis of program impacts, we conducted multivariate analyses of key outcomes at the second assessment, at which point the cumulative effects of program participation would be strongest. In these analyses, we included control variables that were identified as sizable or significant differences between the participant and control groups

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* It is important to reiterate that not all members of the participant group who were assessed actually participated in home visits. Findings in Chapter 7 involve actual participants, matched to an adjusted control group of families with similar characteristics.

** For ordinal variables, such as those analyzed here, an effect size (e.s.) of .1 to .3 is considered small, .31 to .5 is considered moderate, and more than .5 is considered large. We emphasize effect sizes more than the statistical significance of differences between groups because many of the subgroups analyzed are small, so that attaining statistical significance is quite difficult.

for the full sample or in individual communities, differences that might have influenced outcomes. These control factors included maternal age, ethnicity, health, information-seeking behavior, and perceived social support; whether the child had siblings; and household income and environment. The significance of the intervention variable (i.e., belonging to the participant rather than the control group), independent of the influence of these control factors, is discussed for each parenting outcome.

Knowledge of Child Development and Parenting

One of the PAT program's fundamental goals is to increase parents' knowledge of child development and appropriate ways to stimulate children's language, social, and motor development. The PAT curriculum is designed to help parents understand what constitutes normal and appropriate child behavior and to increase their knowledge of the kinds of parenting behaviors that support good child development. The role of educator is central to the understanding that PAT staff have of their purpose. One parent educator described his role this way:

> *"What I see as my job is to educate the parents on what they may not be aware of. I look at my job as an informer."*

Providing information that is grasped by parents is considered an important first step in achieving their goals for their families.

We assessed parent knowledge of child development with a scale composed of 34 questions for families of 1-year-olds and 31 questions for families of 2-year-olds. Items were tailored to the age of the child, as well as to the specific PAT curriculum covered in the first and second years of the program.* We analyzed the knowledge items by computing the percentage of items answered correctly from the entire instrument and from among those items related to specific topic areas, including: general development, cognitive and language development, emotional development, discipline, and child safety and health.

Parents generally answered just over three-fourths of the knowledge items correctly (Table 4-1), with marginally lower scores overall at the second assessment than the first. Scores were fairly consistent across the topics assessed, particularly at the second assessment.

At second birthdays, there was a small effect on overall parent knowledge, as it was measured in this study (e.s.=.14). Multivariate analysis that controlled for various maternal characteristics confirmed a positive effect of program participation on the overall knowledge score at the second assessment that was too small to attain statistical significance. Evaluations of PAT in five other California communities (Wagner et al., 1999; Wagner and Clayton, 1999) also demonstrated little impact on parent knowledge measures at children's second birthdays for the full sample of families.

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* Items were selected in conjunction with staff from the PAT National Center. Some items in both scales were drawn from the Knowledge of Infant Development Inventory (KIDI; MacPhee, 1989).

Table 4-1
PARENT KNOWLEDGE IMPACTS

KIDI Item	Percentage Answered Correctly: Participant Group	Percentage Answered Correctly: Control Group	Effect Size
All items			
At 1-year assessment	78.8	80.0	-.20
At 2-year assessment	77.7	75.9	.14
General child development			
At 1-year assessment	82.4	80.3	.14
At 2-year assessment	74.0	71.9	.13
Language/cognitive development			
At 1-year assessment	70.7	73.9	-.20
At 2-year assessment	79.9	78.7	.07
Emotional development			
At 1-year assessment	75.5	77.9	-.12
At 2-year assessment	79.8	75.1	.24
Discipline			
At 1-year assessment	84.8	85.2	-.02
At 2-year assessment	75.4	75.8	-.02
Child care and safety			
At 1-year assessment	84.0	85.5	-.09
At 2-year assessment	74.3	74.6	-.01
Sample size (1-year/2-year assessment)	147/109	197/159	

Among the subscales, the strongest effect was at the second assessment for knowledge of children's emotional development, although the effect was still small (e.s.=.24). Only general child development items showed consistent small positive effects at both assessments (e.s.=.14 and .13).

Overall scores on most measures were notably lower for very-low-income families than for those with more moderate incomes, suggesting generally less-well-informed parents among very-low-income families (Table 4-2). However, stronger positive effects than those for the full sample were noted among the very-low-income families on four of the six knowledge measures, with the strongest effects being on the overall score and on knowledge of language and emotional development (e.s.=.33, .31, and .35). In contrast, no positive effects were noted for more-moderate-income families. This suggests that the greatest benefits in parenting knowledge accrued to those with the most to learn.

Across the sites, Site 1 had somewhat higher overall scores (Table 4-3). For example, full-scale scores ranged from 83 to 86 across the groups and assessment points, whereas most scores in other sites were below 80. Site 1 also had somewhat more consistent positive effects than other sites, a relationship contrary to the findings regarding income, where those with the lowest scores showed the greatest benefit. There was a small positive effect on the full scale for both years in Site 1; the positive impact on emotional development items was moderate in size and statistically significant at the second assessment (e.s.=.44; $p<.05$). The fact that Site 1 had somewhat better-educated mothers who more actively sought information about children and parenting may help explain the relatively greater knowledge impacts in that community.

Table 4-2
PARENT KNOWLEDGE IMPACTS, BY INCOME LEVEL

KIDI Item	Very Low Income: Percentage Answered Correctly — Participant Group	Very Low Income: Percentage Answered Correctly — Control Group	Very Low Income: Effect Size	More Moderate Income: Percentage Answered Correctly — Participant Group	More Moderate Income: Percentage Answered Correctly — Control Group	More Moderate Income: Effect Size
All items						
At 1-year assessment	74.8	74.7	.02	82.6	84.9	-.19
At 2-year assessment	**72.3**	**68.0**	**.33**	80.2	81.2	-.09
General child development						
At 1-year assessment	82.3	76.5	.26	84.1	82.8	.08
At 2-year assessment	67.3	66.6	.04	77.1	76.0	.07
Language/cognitive development						
At 1-year assessment	65.6	70.3	-.29	76.6	79.4	-.19
At 2-year assessment	**76.3**	**70.2**	**.31**	81.0	85.3	-.27
Emotional development						
At 1-year assessment	70.4	71.2	-.04	79.9	82.9	-.14
At 2-year assessment	**73.7**	**66.3**	**.35**	81.8	80.6	.07
Discipline						
At 1-year assessment	82.0	79.4	.13	85.7	89.9	-.22
At 2-year assessment	69.7	68.1	.06	78.6	80.2	-.07
Child care and safety						
At 1-year assessment	78.2	77.7	.03	89.7	92.2	-.16
At 2-year assessment	66.7	61.7	.20	80.0	82.5	-.12
Sample size (1-year/2-year assessment)	57/31	61/47		64/55	100/84	

Bold type indicates moderate and large effects.

Interestingly, participant group parents in Site 3 rated their knowledge of children and child development higher than did control group parents (see Table 2-9), but they did not score higher than controls overall on the knowledge items at either assessment. Small effects were noted there only for general child development and emotional development at the second assessment.

Attitudes toward Parenting

Building the self-confidence of parents and improving their attitudes toward themselves and their parenting role are integral parts of the PAT program, embodied in the program's goal "to increase parents' feelings of competence and confidence" (Winter, 1999). Parent educators consider attitude improvements important results of their work. For example, a parent educator in one study site included among her goals helping parents to enjoy their children and their role as parents and to increase their confidence as parents. Commenting on a home visit observed by one of the evaluation staff, this parent educator indicated that the parent's *"attitude is changing. She wants to do the best she can for her daughter to be successful."* She considered this change evidence of the effectiveness of the program for that parent. Another parent educator mirrored

Table 4-3
PARENT KNOWLEDGE IMPACTS, BY SITE

KIDI Item	Site 1			Site 2			Site 3		
	Percentage Answered Correctly			Percentage Answered Correctly			Percentage Answered Correctly		
	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size
All items									
At 1-year assessment	86.4	84.6	.19	79.0	80.1	-.10	74.4	76.0	-.12
At 2-year assessment	85.7	83.2	.24	76.3	75.0	.09	73.0	71.8	.10
General child development									
At 1-year assessment	83.3	79.2	.26	84.2	84.0	-.01	80.6	75.8	.26
At 2-year assessment	75.2	76.3	-.07	70.3	68.6	.10	75.1	70.7	.26
Language/cognitive development									
At 1-year assessment	77.4	76.8	.05	73.2	74.3	-.07	64.7	70.9	-.34
At 2-year assessment	88.6	84.6	.26	82.2	79.0	.20	72.9	74.9	-.10
Emotional development									
At 1-year assessment	87.7	83.4	.27	77.6	74.9	.13	68.9	73.4	-.21
At 2-year assessment	**89.9**	**83.6**	**.44***	77.1	73.0	.17	74.3	70.9	.19
Discipline									
At 1-year assessment	93.6	93.6	.00	82.5	82.0	.03	82.6	81.7	-.01
At 2-year assessment	87.6	89.4	-.09	73.6	74.3	-.03	68.0	68.3	-.01
Child care and safety									
At 1-year assessment	92.2	92.5	-.02	82.9	85.2	-.13	80.0	79.7	.02
At 2-year assessment	87.2	82.3	.24	**70.7**	**80.0**	**-.42**	67.3	67.5	-.01
Sample size (1-year/2-year assessment)	36/33	56/47		49/24	77/34		62/50	64/74	

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: * p< .05.

this sentiment, reporting that she could tell the program was effective with one parent because she saw *"increased self-esteem on the part of the parent."*

Parenting attitudes were assessed with the Parenting Sense of Competence Scale (PSOC; Gibaud-Wallston and Wandersman, 1978), described in the appendix. We analyzed the total PSOC score and scores on the two subscales: parent satisfaction and parent efficacy. In addition, the Child Maltreatment Precursor Scale (CMPS) from the Adult-Adolescent Parenting Inventory (Scott and Hogan, 1987) assesses attitudes toward disciplining children that have been shown to correlate with later abusive behaviors toward them. Finally, we consider parents' responses on a 4-point scale (ranging from 1, "not at all happy," to 4, "very happy") to the following question: In general, how happy have you been whenever you have taken care of [child's name] in the last year?

For the sample overall, parents scored an average of 54 points (72%) on the full PSOC scale (Table 4-4), with higher scores indicating more positive attitudes toward parenting. Scores were relatively higher on the parenting efficacy subscale (averaging more than 28 points, 83%) compared with the parenting satisfaction subscale (averaging almost 26 points, 63%). The average score of 18 on the CMPS was 65% of the possible point range on that scale. A large majority of parents said they were "very happy" taking care of their children. All measures were relatively stable over time, showing little change from one assessment to the next.

Table 4-4
PARENT ATTITUDE IMPACTS

	Participant Group	Control Group	Effect Size
Average score, Parenting Sense of Competence Scale			
Total scale (range = 17 to 68)			
At 1-year assessment	54.4	55.6	-.20
At 2-year assessment	54.2	54.4	-.04
Parenting efficacy subscale (range = 8 to 32)			
At 1-year assessment	28.6	28.8	-.10
At 2-year assessment	28.7	28.7	.01
Satisfaction subscale (range = 9 to 36)			
At 1-year assessment	25.9	26.8	-.20
At 2-year assessment	25.5	25.7	-.05
Average Child Maltreatment Precursor Scale score (range = 6 to 24)			
At 1-year assessment	19.1	19.1	.02
At 2-year assessment	18.3	18.3	.01
Percentage of mothers reporting being "very happy" when they took care of child in last year			
At 1-year assessment	90.2	90.3	.00
At 2-year assessment	**91.6**	**78.7****	**.37**
Sample size (1-year/2-year assessment)	147/109	197/158	

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: ** p< .01.

There were no notable differences between the participant and control groups in the full sample on the PSOC full-scale score or either subscale at the time of the second assessment. Small negative effects at the first assessment were eliminated over time and were inconsequential at the second measurement. Similarly, there was no impact on the Child Maltreatment Precursor Scale score at either assessment. However, there was a moderate and statistically significant difference favoring participant group mothers at the second assessment in the extent to which they reported being "very happy" whenever they had taken care of their children in the preceding year. This change was the result of a reduced percentage of control group mothers who gave favorable reports at the second assessment, not an increase of favorable reports by mothers in the participant group. It is unclear why this self-report of happiness in the parenting role is not accompanied by a difference in the parenting satisfaction subscale of the PSOC, unless response to the happiness item was perceived by mothers to carry a greater sense of social desirability than the several items in the PSOC subscale.

Multivariate analyses confirm these results. No statistically significant effects were noted for program participation on the PSOC scales or the CMPS when other differences between mothers were controlled for in the analyses. However, the effect of program participation was positive and somewhat stronger in relation to mothers' reports of happiness while taking care of their children. Program participation accounted for about one-tenth of a point higher score on this 4-point scale, a difference that approached statistical significance ($p<.08$), but still was quite small.

A general lack of consistent impact on parenting attitudes is similar to findings from other home visitation evaluations. For example, evaluations of PAT in five California communities (Wagner et al., 1999; Wagner and Clayton, 1999) showed a mix of small or inconsequential impacts that were positive for some PSOC measures in some years and negative for others. An evaluation of the Comprehensive Child Development Program (St. Pierre and Layzer, 1999), which included home visitation, showed no effect after 3 years on parents' attitudes toward punishment. However, the evaluation of Hawaii's Healthy Start home visitation program (Duggan et al., 1999) did show a significant positive effect on parents' sense of efficacy at the 2-year follow-up, as measured by the PSOC efficacy subscale.

When we examined attitude measures by income level, we found few differences in PSOC scores between very-low-income families and those with more moderate incomes, unlike the systematic differences noted in parent knowledge scores (Table 4-5). Marginally lower scores for low-income families were apparent. However, unlike findings related to parent knowledge, stronger positive impacts did not accrue to this lower-scoring group. In fact, small to moderate negative effects were noted on all PSOC scale scores for both groups. There were small positive effects on the CMPS score in both years for very-low-income families, which were offset by negative effects for the more-moderate-income group in calculating the effects for the full sample. The moderate effect in the full sample on parents' self-reports of happiness when caring for their children is due primarily to a large, statistically significant positive effect among families with more-moderate incomes (e.s.=.58, $p<.001$).

Table 4-5
PARENT ATTITUDE IMPACTS, BY INCOME LEVEL

	Very Low Income			More Moderate Income		
	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size
Average score, Parenting Sense of Competence Scale						
Total scale (range = 17 to 68)						
At 1-year assessment	**53.6**	**55.7**	**-.34**	**54.6**	**56.3**	**-.30**
At 2-year assessment	52.2	53.2	-.17	54.7	55.4	-.14
Parenting efficacy subscale (range = 8 to 32)						
At 1-year assessment	28.3	29.1	-.26	28.6	28.8	-.06
At 2-year assessment	28.4	29.0	-.20	28.7	28.7	-.02
Satisfaction subscale (range = 9 to 36)						
At 1-year assessment	25.3	26.6	-.27	**26.0**	**27.6**	**-.36**
At 2-year assessment	23.8	24.2	-.10	26.0	26.7	-.16
Average Child Maltreatment Precursor Scale score (range = 6 to 24)						
At 1-year assessment	18.4	18.1	.12	19.8	20.0	-.08
At 2-year assessment	17.2	16.8	.18	18.6	19.2	-.22
Percentage of mothers reporting being "very happy" when they took care of child in last year						
At 1-year assessment	86.8	86.4	.01	90.9	92.4	-.05
At 2-year assessment	80.6	74.5	.15	**98.2**	**83.1**	**.58*** **
Sample size (1-year/2-year assessment)	57/31	61/47		63/55	100/84	

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: *** p<.001.

Looking across sites (Table 4-6), Site 1 parents had somewhat higher scores on all measures; for example, the overall PSOC score averaged about 55.5 to 57.5 in Site 1, compared with scores of 55.0 or below for all groups and assessments in the other sites. However, impacts of attitudes measured by the PSOC and the CMPS were small or inconsequential in Sites 1 and 3 and inconsistent in direction. In Site 2, negative impacts on the PSOC satisfaction subscale were moderate at both assessments (e.s.=-.36 and -.43), resulting in small to moderate negative impacts for the total score in that site (e.s.=-.31 and -.17). Site 1 was the only community in which small effects on the Child Maltreatment Precursor Scale were found, although these were inconsistent in direction across the two assessments. Moderate to large effects on mothers' reports of being "very happy" when taking care of their children were noted in all sites for at least one of the assessments.

Table 4-6
PARENT ATTITUDE IMPACTS, BY SITE

	Site 1			Site 2			Site 3		
	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size
Average score, Parenting Sense of Competence Scale									
Total scale (range = 17 to 68)									
At 1-year assessment	57.2	57.6	-.08	**52.9**	**54.7**	**-.31**	54.1	55.0	-.16
At 2-year assessment	55.4	55.6	-.03	51.8	52.7	-.17	54.5	54.4	.03
Satisfaction subscale (range = 9 to 36)									
At 1-year assessment	28.2	28.2	-.02	**24.7**	**26.4**	**-.36**	25.5	26.0	-.11
At 2-year assessment	27.2	26.9	.07	**23.4**	**25.0**	**-.43**	25.4	25.4	.02
Parenting efficacy subscale (range = 8 to 32)									
At 1-year assessment	29.1	29.4	-.13	28.2	28.3	-.05	28.6	29.0	-.13
At 2-year assessment	28.3	28.7	-.21	28.4	27.6	.29	29.1	29.0	.02
Average Child Maltreatment Precursor Scale (range = 6 to 24)									
At 1-year assessment	21.3	20.5	.25	18.9	18.7	.09	18.0	18.2	-.06
At 2-year assessment	19.9	20.5	-.21	17.9	17.7	.05	17.4	17.2	.10
Percentage of mothers reporting being "very happy" when they took care of child in last year									
At 1-year assessment	**100.0**	**87.0**	**.74***	83.0	90.7	-.23	91.9	92.2	-.01
At 2-year assessment	91.2	87.2	.13	**87.0**	**62.5**	**.58***	**94.0**	**80.3**	**.43**
Sample size (1-year/2-year assessment)	36/34	56/47		49/25	77/34		62/50	64/77	

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: * p<.05.

Parenting Behaviors

Positive parenting behaviors are the ultimate outcome that PAT seeks to achieve among parents. Increased knowledge and improved attitudes, plus the concrete instruction, suggestions, and modeling provided by PAT educators, are intended to combine to produce positive parenting practices.

One of the parent behaviors PAT seeks to enhance is the ability of parents to observe their children's actions and development. Parent educators ask parents at each visit to report on what they have observed their children doing and how children have changed and developed since the last visit. By becoming more astute observers of their children's behavior, parents are expected to be able to respond more promptly and appropriately to children's needs.

At the first assessment, parents were asked the following question:

> If someone asked you to describe the little details about how (CHILD) does things, how hard would it be for you to think of things to say? For example, could you tell someone whether (CHILD) picks up small objects with (his/her) whole fist, or with just two fingers? Or could you describe how (CHILD) shows or tells you he/she is hungry or thirsty? Would you say that describing these kinds of details would be very hard, somewhat hard, not very hard, or not at all hard?

The question at the second assessment was essentially the same, with the first example changed to the way the child climbs up stairs.

Overall, parents found observing and reporting children's behavior to be "not at all hard," with an average score of almost 4 (Table 4-7). Differences between the participant and control groups in self-reported observation skills at the first assessment were small and favored the control group. There were no differences between the groups at the second assessment. This is not surprising because the overall high scores exerted a "ceiling effect" that made it virtually impossible to bring about an increase in self-reported ease of observation. Multivariate analysis confirms the lack of impact of program participation on parental report of ease of observation, controlling for other factors in the analyses.

Average scale scores were quite similar for the very-low-income and more-moderate-income groups. Small to moderate negative effects were noted in both years for the lowest-income group; a moderate negative effect shifted to a small positive effect in the second year for the more-moderate-income group.

Scores were high in all sites, ranging from 3.5 to 4.0 across measurements and sites. As with earlier measures, Sites 1 and 3 had small or inconsequential effects that varied in direction. The effect in Site 2 was negative at the first assessment and of moderate size; by the second assessment, the measure was positive but small.

Table 4-7
IMPACTS ON PARENTS' OBSERVATION OF THEIR CHILDREN

Average Parent Observation Scale score (range 1 to 4; 4 = more observant)	Participant Group	Control Group	Effect Size
All Assessed Families			
At 1-year assessment	3.7	3.8	-.21
At 2-year assessment	3.8	3.8	.01
Very-Low-Income Families			
At 1-year assessment	3.7	3.8	-.26
At 2-year assessment	**3.8**	**4.0**	**-.41**
More-Moderate-Income Families			
At 1-year assessment	**3.7**	**3.8**	**-.31**
At 2-year assessment	3.8	3.8	.13
Site 1			
At 1-year assessment	3.8	3.9	-.12
At 2-year assessment	3.7	3.7	.01
Site 2			
At 1-year assessment	**3.5**	**3.8**	**-.41**
At 2-year assessment	3.7	3.6	.16
Site 3			
At 1-year assessment	3.8	3.8	-.08
At 2-year assessment	4.0	4.0	-.17
Sample size: Total sample (1-year/2-year assessment)	147/108	193/159	
Very-low-income (1-year/2-year assessment)	53/31	59/47	
More-moderate-income (1-year/2-year assessment)	55/55	92/83	
Site 1 (1-year/2-year assessment)	34/31	55/45	
Site 2 (1-year/2-year assessment)	49/25	77/33	
Site 3 (1-year/2-year assessment)	62/50	63/77	

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: * p< .05

Another area of particular interest in the PAT curriculum involves language-, literacy-, and numeracy-promoting behaviors, including such things as talking and reading to children from birth. Talking and reading to children are highly encouraged by parent educators, many of whom leave books with parents after home visits to encourage them to read to children.

To assess impacts on these kinds of behaviors, parents were asked a series of questions about direct verbal interactions with children in the course of routine activities (i.e., talking to children, reading aloud from things like cereal boxes, and counting or using numbers), intentionally engaging children in word play (i.e., telling stories, saying nursery rhymes, singing songs), and reading to children (e.g., frequency of reading, asking questions of the child about what is being read). Each question was answered on a 4-point scale, with 4 being the most positive response. An overall scale was formed by summing the values on these six items. In addition, we examined a subscale of eight items from the Home Observation for Measurement of the Environment scale (HOME; Caldwell and Bradley, 1984) related to language- and literacy-promotion behaviors (e.g., the parent reads stories to the child at least three times a week, the parent talks to the child while doing daily work).

Overall, parents scored about 19 of 24 points on the overall language/literacy/numeracy promotion scale (Table 4-8), with an increase of about one point from the first to the second assessment. Of the specific activities included in the scale, reading aloud to children was the least frequently reported activity, and talking to children while reading was the most frequent (among those who read to children).

Table 4-8 indicates a small positive effect at the first assessment on the overall literacy promotion scale (e.s.=.12). Although the score for reading aloud to children while doing everyday things was the lowest at both assessments, the benefits to participants were most consistent on this scale (e.s.=.13 and .20). In addition, there was a small positive effect at the

Table 4-8
PARENTS' LANGUAGE- AND LITERACY-PROMOTING BEHAVIORS

Mean Scale Score	Participant Group	Control Group	Effect Size
Average language/literacy/numeracy promotion scale score (range = 6 to 24)			
At 1-year assessment	19.0	18.5	.12
At 2-year assessment	20.0	19.7	.09
Average language/literacy/numeracy promotion subscale scores (range = 1 to 4)			
While doing everyday things, parent:			
Talks to/asks child questions			
At 1-year assessment	3.3	3.2	.09
At 2-year assessment	3.3	3.4	-.09
Reads aloud to child			
At 1-year assessment	2.8	2.6	.13
At 2-year assessment	3.1	2.9	.20
Counts things, sings or says counting rhymes or uses numbers with child			
At 1-year assessment	3.1	3.2	-.10
At 2-year assessment	3.4	3.4	.04
Tells stories, says nursery rhymes, sings with child			
At 1-year assessment	3.4	3.5	-.02
At 2-year assessment	3.4	3.2	.19
Looks at or reads books with child			
At 1-year assessment	3.0	3.0	.07
At 2-year assessment	3.2	3.2	.05
Talks to/asks child questions while reading to child			
At 1-year assessment	3.3	3.1	.20
At 2-year assessment	3.6	3.6	-.04
HOME subscale related to language- and literacy-promoting behaviors (range = 0 to 8)			
At 1-year assessment	5.5	5.3	.08
At 2-year assessment	**6.5**	**6.1**	**.31**
Sample size: All families (1-year/2-year assessment)	148/109	195/157	
Families who read to children (1-year/2-year assessment)	142/108	185/153	

Bold type indicates moderate and large effects.

second assessment regarding telling stories, saying nursery rhymes, and singing songs (e.s.=.19). The HOME subscale related to literacy promotion showed a moderate positive effect in the second year, with an effect size of .31 being the largest effect noted in this behavior domain.

Multivariate analyses confirm these results. Controlling for other differences between mothers, program participation had a positive, but very small, nonsignificant effect on the overall language and literacy promotion scale. However, a statistically significant positive relationship was noted between program participation and the HOME language and literacy promotion subscale. Program participation accounted for a .3-point higher score on this 8-point subscale ($p<.05$).

Unlike some of the other parent outcomes we have examined, very-low-income families did not have consistently lower scores on these measures than more-moderate-income families (Table 4-9), although the overall language/literacy/numeracy promotion score and the HOME subscale were marginally lower for the poorer families. The very-low-income group, however, did have more positive effects than the wealthier group, including benefits on the overall language/literacy/numeracy promotion scale score, and small to moderate benefits on reading aloud and telling stories to children, which reached statistical significance in some years. Effects were more likely to be negative than positive for the more-moderate-income group, although all effects were small. However, the more-moderate-income group showed greater benefits on the HOME subscale score on literacy promotion. Therefore, it is impossible to include that there is a particular advantage to one income group over the other in this behavior domain.

Examining these measures by site (Table 4-10), we again found somewhat higher scores in Site 1. Only the HOME subscale score at the second assessment showed consistent positive effects across sites, with moderate to large effects in Sites 1 and 2 (e.s.=.39 and .51, $p<.05$); on all other measures, both positive and negative effects were noted, most of them small. Exceptions included a large, statistically significant positive effect on reading books with children (e.s.=.71, $p<.001$) and a moderate effect on talking to children or reading to them (e.s.=.35) in Site 1. However, the effects were not sustained at this level in the second year. Moderate positive effects were consistent across the two assessments on the HOME language promotion subscale (e.s.=.36 and .39), with the effect at the first assessment being statistically significant. In addition, Site 3 demonstrated a moderate positive effect at the first assessment on the overall literacy promotion measure (e.s.=.31), which was reduced to a small effect by the second assessment, and had moderate positive effects for reading aloud to children, the effect being statistically significant at the first assessment (e.s. =.45, $p<.001$, and .30). Similarly there was a significant positive effect in Site 3 at the second assessment for telling stories, saying nursery rhymes, and singing songs (e.s.=.50, $p<.01$).

Table 4-9
LANGUAGE- AND LITERACY-PROMOTING BEHAVIORS, BY INCOME LEVEL

Mean Scale Score	Very Low Income			More Moderate Income		
	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size
Average language/literacy/numeracy promotion scale score (range = 6 to 24)						
At 1-year assessment	18.8	17.9	.24	19.4	19.3	.04
At 2-year assessment	19.7	19.1	.17	20.1	20.2	-.03
Average language/literacy/numeracy promotion subscale scores (range = 1 to 4)						
While doing everyday things, parent:						
Talks to/asks child questions						
At 1-year assessment	3.2	3.1	.10	3.3	3.3	.00
At 2-year assessment	3.2	3.4	-.30	3.4	3.4	.04
Reads aloud to child						
At 1-year assessment	**3.0**	**2.5**	**.46***	2.8	2.8	.01
At 2-year assessment	**3.2**	**2.8**	**.31**	3.0	2.9	.17
Counts things, sings or says counting rhymes or uses numbers with child						
At 1-year assessment	3.1	3.2	.02	3.1	3.2	-.11
At 2-year assessment	3.5	3.3	.26	3.4	3.4	.04
Tells stories, says nursery rhymes, sings with child						
At 1-year assessment	3.5	3.3	.21	3.4	3.6	-.19
At 2-year assessment	**3.4**	**2.9**	**.49***	3.3	3.4	-.12
Looks at or reads books with child						
At 1-year assessment	2.8	2.8	-.03	3.3	3.2	.16
At 2-year assessment	3.0	3.0	.01	3.4	3.4	-.06
Talks to/asks child questions while reading to child						
At 1-year assessment	3.2	3.1	.07	3.5	3.2	.16
At 2-year assessment	3.4	3.6	-.19	3.7	3.8	-.25
HOME subscale related to language- and literacy-promoting behaviors (range = 0 to 8)						
At 1-year assessment	4.5	4.5	.02	6.2	6.0	.12
At 2-year assessment	5.7	5.5	.14	**7.0**	**6.6**	**.33**
Sample size: 1-year/2-year assessment	56/30	60/45		62/54	99/80	

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: * $p < .05$.

Table 4-10
LANGUAGE/LITERACY/NUMERACY-PROMOTING BEHAVIORS, BY SITE

Mean Scale Score	Site 1			Site 2			Site 3		
	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size
Average language/literacy/numeracy promotion scale score (range = 6 to 36)									
At 1-year assessment	20.8	20.3	.15	17.6	17.7	-.02	**19.0**	**17.8**	**.31**
At 2-year assessment	21.3	21.1	.06	18.5	18.3	.07	19.8	19.4	.12
Average language/literacy/numeracy promotion subscale score (range = 1 to 4)									
While doing everyday things, adult:									
Talks to/asks questions of child									
At 1-year assessment	3.7	3.7	-.07	3.0	2.9	.10	3.3	3.1	.19
At 2-year assessment	3.7	3.6	.06	3.0	2.9	.21	3.2	3.4	-.27
Reads aloud to child									
At 1-year assessment	3.1	3.3	-.18	2.4	2.4	.06	**2.9**	**2.4**	**.45*****
At 2-year assessment	3.2	3.2	.06	2.8	2.7	.13	**3.1**	**2.8**	**.30**
Counts, sings/says counting rhymes, uses numbers									
At 1-year assessment	3.1	3.3	-.21	2.8	3.0	-.19	3.3	3.2	.00
At 2-year assessment	3.5	3.6	-.07	2.9	3.0	-.06	3.5	3.4	.17
Tells stories/nursery rhymes, sings songs									
At 1-year assessment	3.5	3.6	-.07	3.3	3.5	-.18	3.5	3.4	.19
At 2-year assessment	3.4	3.5	-.14	3.0	3.0	.01	**3.5**	**3.1**	**.50****
Looks at or reads books with child									
At 1-year assessment	**3.6**	**3.1**	**.71*****	2.8	3.0	-.15	2.9	2.9	-.05
At 2-year assessment	3.6	3.4	.26	3.1	3.2	-.07	3.1	3.1	-.02
Talks/asks questions while reading to child									
At 1-year assessment	**3.8**	**3.6**	**.35**	3.4	3.2	.15	3.3	3.0	.29
At 2-year assessment	3.8	3.8	.08	3.6	3.3	.30	3.5	3.7	-.23
HOME subscale related to language- and literacy-promoting behaviors (range = 0 to 8)									
At 1-year assessment	7.0	6.6	**.36***	4.8	4.3	.24	5.2	5.5	-.26
At 2-year assessment	**7.2**	**6.8**	**.39**	**6.2**	**5.3**	**.51***	6.2	6.0	.22
Sample size: All families (1-year/2-year assessment)	34/31	55/45		49/25	77/33		62/50	63/77	
Families who read to children (1-year/2-year assessment)	34/34	45/46		42/24	66/33		59/50	49/76	

Bold type indicates moderate or large effects. Statistically significant difference between groups in a one-tailed test at the following levels: *** p< .001, ** p< .01, * p< .05

A number of other aspects of parenting behavior were measured with the Home Observation for Measurement of the Environment scale. The overall HOME scale and the traditional six subscale scores were calculated. Overall scores were around 34 (out of a total possible score of 45, about 75%) at the first assessment (Table 4-11) and marginally higher at the second assessment (36 to 37, about 80%). This level is similar to those observed in other home visitation evaluations. For example, evaluations of PAT in five California communities (Wagner et al., 1999; Wagner and Clayton, 1999) showed HOME scores of 36 to 38 at children's second birthdays, the evaluation of Hawaii's Healthy Start program (Duggan et al., 1999) had average HOME scores of about 35 at the 2-year follow-up, and the CCDP evaluation had HOME scores of around 33 for parents of 4-year-olds (St. Pierre et al., 1994).

Table 4-11
PARENTING BEHAVIOR IMPACTS MEASURED BY THE HOME SCALE

	Participant Group	Control Group	Effect Size
Average total HOME score (range = 0 to 45)			
At 1-year assessment	34.1	34.2	-.01
At 2-year assessment	37.7	36.4	.22
Average HOME subscale scores related to:			
Parental responsivity (range = 0 to 11)			
At 1-year assessment	8.5	8.5	-.02
At 2-year assessment	9.4	9.3	.09
Acceptance of child's behavior (range = 0 to 8)			
At 1-year assessment	6.0	6.2	-.12
At 2-year assessment	6.0	5.7	.22
Organization of the environment (range = 0 to 6)			
At 1-year assessment	5.3	5.3	.03
At 2-year assessment	5.7	5.6	.17
Appropriate play materials (range = 0 to 9)			
At 1-year assessment	6.8	6.7	.06
At 2-year assessment	7.9	7.4	.26
Involvement with child (range = 0 to 6)			
At 1-year assessment	4.1	4.1	-.01
At 2-year assessment	5.0	4.9	.02
Opportunities for stimulation (range = 0 to 5)			
At 1-year assessment	3.4	3.4	-.02
At 2-year assessment	3.7	3.5	.20
Sample size (1-year/2-year assessment)	148/104	195/150	

HOME = Home Observation for Measurement of the Environment

A small positive effect on parenting behavior was observed for the full sample at the second assessment (e.s.=.22). This overall effect resulted from small impacts on behaviors related to acceptance of children's behavior, organization of the environment, providing appropriate play materials, and providing opportunities for daily simulation (e.s.=.16 to .26). Although small, these effects are somewhat larger and more consistently positive than those found in the California PAT, the Hawaii Healthy Start, and the CCDP evaluations.

Multivariate analyses show that the effects of program participation on the HOME scale and subscales were positive in all cases, but only in the case of the subscale for the acceptance of children's behavior was the difference statistically significant, controlling for other factors in the analyses. PAT program participation accounted for a .4-point higher score on this 8-point subscale ($p<.05$).

Scores were lower on all HOME measures for very-low-income families than for those with more-moderate incomes (Table 4-12). Findings generally were inconsistent regarding whether the two income groups benefited differentially from participation in the PAT program. For example, the largest measured effect was a statistically significant, moderate effect on acceptance of children's behavior, measured for the more-moderate-income group; this group also had a stronger effect for the overall HOME score and the opportunities for daily stimulation subscale. In contrast, the very-low-income group had moderate effects on the organization of the environment and appropriate play materials subscales, on which the more-moderate-income group registered only small effects. Thus, we reach no conclusion regarding the relative benefits of the program to families of different income levels.

When we look at site differences, Site 2 again shows lower overall scores on parenting behaviors than the other sites, although differences were smaller at the second assessment than at the first. The small positive effect on the HOME scores for the full sample of families resulted primarily from more significant impacts occurring in this site (Table 4-13). A statistically significant moderate effect (e.s.=.50, $p<.05$) was found in Site 2 at the second assessment for the overall HOME score, and moderate or large effects were noted for five of the six subscales. Effects related to acceptance of children's behavior and involvement with children were statistically significant (e.s.=.47 and .51, $p<.05$). A moderate positive effect on organization of the environment at the second assessment also was found in Site 3, but these beneficial impacts were offset by a moderate negative effect in Site 1 in calculating the effect for the full sample. Two moderate negative effects were noted, but these were isolated effects that were not consistent for the same measures at the two assessment points.

Table 4-12
PARENTING BEHAVIOR IMPACTS MEASURED BY THE HOME SCALE, BY INCOME LEVEL

	Very Low Income			More Moderate Income		
	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size
Average total HOME score						
At 1-year assessment	29.3	30.3	-.12	37.2	37.1	.02
At 2-year assessment	34.7	33.9	.11	39.7	38.6	.29
Average HOME subscale scores related to:						
Parental responsivity						
At 1-year assessment	7.3	7.6	-.11	9.3	9.3	.02
At 2-year assessment	8.6	8.8	-.07	10.0	9.9	.08
Acceptance of child's behavior						
At 1-year assessment	5.4	5.7	-.17	6.3	6.5	-.17
At 2-year assessment	5.4	5.4	.04	**6.5**	**5.9**	**.49****
Organization of the environment						
At 1-year assessment	4.9	5.1	-.13	5.5	5.5	.00
At 2-year assessment	**5.7**	**5.4**	**.31**	5.7	5.6	.14
Appropriate play materials						
At 1-year assessment	5.7	5.6	.03	7.4	7.4	.01
At 2-year assessment	**7.2**	**6.4**	**.33**	8.3	8.2	.14
Involvement with child						
At 1-year assessment	3.1	3.3	-.10	4.8	4.6	.11
At 2-year assessment	4.7	4.9	-.14	5.1	5.1	.01
Opportunities for stimulation						
At 1-year assessment	2.8	3.0	-.16	3.9	3.8	.10
At 2-year assessment	3.1	3.0	.12	4.1	3.9	.21
Sample size (1-year/2-year assessment)	56/30	60/45		62/54	99/80	

HOME = Home Observation for Measurement of the Environment.

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: ** p<.01.

Table 4-13
PARENTING BEHAVIOR IMPACTS MEASURED BY THE HOME SCALE, BY SITE

	Site 1			Site 2			Site 3		
	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size	Participant Group	Control Group	Effect Size
Total HOME score									
At 1-year assessment	40.6	39.4	.26	29.7	29.7	-.01	34.1	35.2	-.19
At 2-year assessment	39.4	39.1	.06	34.4	30.4	**.50***	38.2	37.2	.22
Subscale scores related to:									
Parental responsivity									
At 1-year assessment	10.3	9.8	.25	7.6	7.3	.10	8.2	8.8	-.28
At 2-year assessment	9.6	9.7	-.03	8.9	8.3	.28	9.6	9.4	.08
Acceptance of child's behavior									
At 1-year assessment	6.8	6.8	.07	5.8	5.7	.08	5.6	6.2	**-.40***
At 2-year assessment	6.6	6.2	.27	5.8	4.8	**.47***	5.8	5.7	.07
Organization of the environment									
At 1-year assessment	5.8	5.7	.25	4.7	4.8	-.06	5.5	5.5	.00
At 2-year assessment	**5.7**	**5.9**	**-.41**	**5.2**	**4.9**	**.32**	**5.8**	**5.6**	**.43**
Appropriate play materials									
At 1-year assessment	8.1	7.9	.12	5.4	5.5	-.06	7.3	7.0	.14
At 2-year assessment	**8.7**	**8.3**	**.38**	6.7	6.0	.30	7.9	7.4	.27
Involvement with child									
At 1-year assessment	5.4	5.2	.18	3.1	3.0	.04	4.2	4.5	-.27
At 2-year assessment	4.7	5.0	-.18	**4.1**	**3.2**	**.51***	5.5	5.6	-.18
Opportunities for stimulation									
At 1-year assessment	4.2	3.9	.25	3.1	3.3	-.20	3.3	3.2	.11
At 2-year assessment	3.9	3.9	-.02	**3.7**	**3.2**	**.46**	3.7	3.4	.23
Sample size (1-year/2-year assessment)	34/31	55/45		49/23	77/31		62/50	63/74	

HOME = Home Observation for Measurement of the Environment.

Bold type indicates moderate and large effects. Statistically significant difference between groups in a one-tailed test at the following level: * p<.05.

Another intention of the PAT program is to improve parent-child interactions and strengthen family relationships. Although the evaluation did not address the broader issue of family relationships, we did examine the interactions between parents and children, a primary vehicle through which benefits to children of improved parenting should occur. The Nursing Child Assessment Satellite Training (NCAST) teaching scale was used at second birthdays to assess, through observation, the interactions of parents and children. (It was not administered at first birthdays because it was unlikely that sufficient behavior change would have occurred by that time to warrant use of this somewhat time-intensive and costly instrument.) In addition, items selected from the HOME scale related to parent-child interactions were used to form a subscale that measures parent reports of their interactions with their children.

The total NCAST scores were about 53, or 73% of the total possible score of 73 points (Table 4-14); scores for caregivers were about 40 and for children about 12. These were quite similar to scores reported for a large national sample of low-income parents in the CCDP evaluation (St. Pierre et al., 1994), which had caregiver and child scores that averaged 40 and 15 (St. Pierre and Layzer, 1999).

For the full sample, no overall effects were noted on the NCAST total scale. However, a small positive effect for the parent scale was noted (e.s.=.19), with the largest effect for parents relating to responses to children's distress (e.s.=.23). No meaningful effect was noted for the child scale or subscales. This lack of impact on an observational measure of parent-child interactions reflects similar findings for the CCDP (St. Pierre et al., 1994) and Hawaii Healthy Start evaluations (Duggan et al., 1999). A small positive effect was noted at the second assessment on the HOME subscale related to mother-child interactions.

Multivariate analyses confirm these results. PAT program participation had no significant effect on NCAST scores, controlling for other factors in the analyses. However, the relationship to the HOME mother-child interaction subscale score approached statistical significance ($p<.06$), accounting for a .2-point higher score on this 6-point subscale.

Regarding income differences, NCAST measures were somewhat lower for the very-low-income group than for less-poor families. Impacts measured by the NCAST were positive, but inconsequential, for the lowest-income group and were small and mixed in direction for the more-moderate-income group. Both groups had small positive effects in the second year on the HOME subscale score.

When looking at site differences, Site 2 had somewhat lower scores than the other sites and the strongest positive effects, as was true with the HOME scores. Moderate positive effects were noted for six of the nine NCAST measures, including the total score and overall scores for both parents and children. The HOME parent-child interaction subscale also showed consistently positive, though small, effects at both assessments. A moderate effect on response to children's distress was noted in Site 3, but a moderate negative effect on children's responsiveness to caregivers offset the positive effect in calculating the overall score for that site. However, a moderate positive effect was measured at the second assessment on the HOME parent-child interaction subscale in Site 3. Site 1 showed no consistent or meaningful pattern of effects on any measures.

Table 4-14
IMPACTS ON PARENT-CHILD INTERACTIONS

	Participant Group	Control Group	Effect Size
All Assessed Families			
Total NCAST scale score	52.6	52.9	.09
Average NCAST parent scale score	40.4	39.2	.19
Average NCAST child scale score	12.3	12.7	-.07
HOME parent-child interaction subscale score			
At 1-year assessment	1.6	1.5	.02
At 2-year assessment	2.5	2.3	.21
Very-low-income Families			
Total NCAST scale score	49.5	48.7	.09
Average NCAST parent scale score	39.0	38.8	.03
Average NCAST child scale score	10.5	10.0	.10
HOME parent-child interaction subscale score			
At 1-year assessment	1.0	1.0	.02
At 2-year assessment	2.2	2.0	.18
More-moderate-income Families			
Total NCAST scale score	53.3	54.2	-.12
Average NCAST parent scale score	41.2	40.4	.16
Average NCAST child scale score	12.3	13.8	-.30
HOME parent-child interaction subscale score			
At 1-year assessment	2.0	1.9	.08
At 2-year assessment	2.8	2.5	.27
Site 1			
Total NCAST scale score	56.8	56.4	.05
Average NCAST parent scale score	40.8	40.4	.08
Average NCAST child scale score	16.0	16.2	-.03
HOME parent-child interaction subscale score			
At 1-year assessment	2.6	2.4	.15
At 2-year assessment	2.6	2.8	-.24
Site 2			
Total NCAST scale score	**50.1**	**46.0**	**.45**
Average NCAST parent scale score	**37.5**	**34.5**	**.39**
Average NCAST child scale score	**12.6**	**11.5**	**.31**
HOME parent-child interaction subscale score			
At 1-year assessment	1.1	.8	.25
At 2-year assessment	**2.4**	**2.0**	**.32**
Site 3			
Total NCAST scale score	51.0	51.8	-.11
Average NCAST parent scale score	41.4	40.5	.17
Average NCAST child scale score	9.7	11.2	-.28
HOME parent-child interaction subscale score			
At 1-year assessment	**1.4**	**1.7**	**-.32**
At 2-year assessment	**2.5**	**2.1**	**.44**
Sample sizes: All families (1-/2-year assessment)	148/104	195/150	
Very-low-income families (1-/2-year assessment)	56/30	60/47	
More-moderate-income families (1-/2-year assessment)	62/54	99/82	
Site 1 (1-/2-year assessment)	34/31	55/45	
Site 2 (1-/2-year assessment)	49/23	77/31	
Site 3 (1-/2-year assessment)	62/50	63/74	

Bold type indicates moderate and large effects.

Summary

Families participating in the Multisite Evaluation had scores for many parent outcomes that ranged from 63% to 83% of the maximum possible scores on those measures, scores that were consistent with those obtained on similar measures in other studies of programs serving low-income families. Scores were not significantly higher at the second assessment than at the first for outcomes that were measured at both times. Scores were lower on several measures for families with very low incomes and for those in Site 2, compared with families of higher incomes and in the other communities.

Table 4-15 summarizes the parent impacts at second assessments associated with PAT participation. For participants as a whole, there was a pattern of generally small positive effects on measures that represent each of the three parent outcome domains assessed: parenting knowledge, attitudes, and behaviors. Of the 25 measures summarized in Table 4-15, 12 showed positive effects, including 2 that were moderate in size; no negative effects were noted.

The most consistent positive effects were noted for parenting behaviors, including the overall HOME scale score, six HOME subscale scores (including a moderate effect on language- and literacy-promoting behaviors), and the caregiver subscale score on the NCAST. The measure of overall parenting knowledge also showed a small effect, reflecting effects on knowledge of general child development and children's emotional development. No parent attitude impact was detected except for a moderate positive effect on parents' reports of being happy when caring for their children.

These overall findings are consistent with those identified in evaluations of family support programs in general and home visiting programs in particular. Barnes, Goodson, and Layzer (1995), in reviewing the parenting impacts of universal access programs, such as PAT, concluded that "universal access programs provide some evidence of positive effects on parenting" (p. 5-2). For example, evaluations of the Missouri PAT program (Pfannenstiel and Seltzer, 1989; Pfannenstiel et al., 1995) found positive effects on parenting knowledge, attitudes, and behaviors, although they did not use rigorous evaluation designs. Similarly, several studies of two-generation programs for low-income families found benefits on such dimensions as the home learning environment, maternal behaviors and attitudes toward children (Avance Family Support and Education Program, Johnson and Walker, 1991), parent-child interactions (Child and Family Resource Program, Travers, Nauta, and Irwin, 1982; Comprehensive Child Development Program, St. Pierre et al., 1994), and emotional support for children and child-rearing attitudes (New Chance, Quint, Polit, Box, and Cave, 1994). A randomized trial of PAT and case management services for teen parents in four California communities found small positive effects on parenting knowledge and attitudes (Wagner et al., 1996). Evaluations of the Missouri PAT program (Pfannenstiel and Seltzer, 1989; Pfannenstiel et al., 1995) found positive effects on parenting knowledge, attitudes, and behaviors, although they did not use rigorous evaluation designs.

But benefits were far from universally achieved. Olds and Kitzman (1993) conducted a review of research on 15 home visiting programs for low-income families that assessed parenting impacts. They found positive impacts for eight programs (e.g., Lambie, Bond, and Weikart,

Table 4-15
SUMMARY OF PAT PROGRAM IMPACTS ON PARENTS AT SECOND ASSESSMENTS

Parenting Outcomes	Total Sample	Very Low Income	More Moderate Income	Site 1	Site 2	Site 3
Parent knowledge scale	+	**+**		+		
General child development subscale	+					+
Language development subscale		**+**	-	+	+	
Emotional development subscale	+	**+**		**++***	+	+
Discipline						
Child care and safety		+	-	+	**-**	
PSOC parenting attitudes scale		-	-		-	
PSOC parenting satisfaction subscale		-			**-**	
PSOC parenting efficacy subscale			-	-	+	
Parents' happiness caring for children	**+**	+	**++***	+	**++***	**+**
Precursor of Child Maltreatment subscale		+	-	-		
Parent observation scale		**-**	+		+	-
Language/literacy/numeracy-promoting behavior scale		+				+
HOME language/literacy-promoting behaviors subscale	**+**	+	**+**	**+**	**++***	+
Total HOME scale	+	+	+		**++***	+
Parental responsivity subscale					+	
Acceptance of child's behavior subscale	+		**++****	+	**++***	
Organization of child's environment subscale	+	**+**	+	**-**	**+**	**+**
Appropriate play materials subscale	+	**+**	+	**+**	+	+
Parental involvement subscale		-		-	**++***	-
Opportunity for stimulation subscale	+	+	+		**+**	+
NCAST total scale score			-		**+**	-
NCAST parent scale score	+		+		**+**	+
NCAST child scale score			-		**+**	-
HOME mother-child interaction subscale	+	+	+		**+**	**+**

+, - Direction of small effects at the second assessment.

+, - Direction of moderate effects at the second assessment.

++, -- Direction of relationships that were moderate or large in size and statistically significant.

Statistically significant difference from the control group in a one-tailed test at the following levels: * p< .05; ** p< .01; *** p< .001.

1974; Field, Widmayer, Greenberg, and Stoller, 1982; Dawson, van Doorninck, and Robinson, 1989; Jester and Guinagh, 1983; Madden, O'Hara, and Levenstein, 1984) on such dimensions as home environment, mother-infant interaction, and maternal responsivity; others showed no effect. Similarly, an evaluation of a PAT program in Texas demonstrated no effects on parenting measures for the highly educated parents in that study (Owen and Mulvihill, 1994).

Often, when parenting benefits were identified, they occurred only for subgroups of participants. For example, a randomized trial evaluating PAT in one California community found moderate positive effects on parent knowledge, but only for Anglo parents. In contrast, moderate effects on parenting efficacy, organization of the child's environment, and literacy-promoting behaviors occurred only for Latina mothers (Wagner et al., 1999).

This propensity for benefits to concentrate in particular subgroups also was apparent in the Multisite Evaluation. Although all subgroups showed benefits on some measures, and small negative effects were scattered throughout, Table 4- reveals that very-low-income families experienced somewhat greater benefits than their more-moderate-income counterparts. Of the 25 outcome measures summarized in the table, very-low-income parents showed positive effects on 13, with effects being moderate in size for 5 of the outcomes. In comparison, more-moderate-income parents demonstrated positive effects on 10 measures, with 3 being moderate to large and 2 of those being statistically significant.

However, benefits were not distributed evenly across the outcome domains for the two income groups. For example, all gains in parenting knowledge were concentrated among very-low-income parents; most were moderate in size. Positive effects on parenting attitudes, as measured by parents' self-reports of happiness when caring for their children, occurred for both income groups, with stronger effects for more-moderate-income families. However, very-low-income parents also exhibited small benefits on attitudes that are precursors of child maltreatment. In contrast, more-moderate-income parents showed more consistent benefits regarding parenting behaviors, showing benefits on 9 of the 14 behavior measures, compared with 7 for very-low-income parents. Benefits to behavior also were marginally stronger for the more-moderate-income group. However, the benefits to very-low-income families, where they occurred, may be particularly important in light of the fact that their scores were lower than those of less-poor families on several of the outcome measures, suggesting that PAT could help close some of the gap between income groups in some aspects of parenting knowledge, attitudes, and behaviors.

Differences in the pattern of parenting outcomes also were apparent across the evaluation communities. The strongest and most consistent pattern of benefits for any subgroup in the evaluation was apparent for participants in Site 2, who showed positive effects on 17 of the 25 parenting outcome measures, including 11 that were moderate or large in size, 5 of which were statistically significant. Sites 1 and 3 had positive effects on 8 and 11 measures, respectively, with 2 being moderate or large in Site 1 and 3 in Site 3. Particularly strong and consistent benefits were noted in Site 2 regarding parenting behaviors, with 13 of the 14 measures showing positive effects, 10 of them moderate or large and 4 of them statistically significant. This pattern of benefits to parenting behaviors in Site 2 was more consistent and strongly positive than is characteristic of findings from most evaluations of home visiting and family support programs. On many measures, scores for families in Site 2 were lower than those in other sites, particularly

those in Site 1, offering some support for the notion that PAT may benefit most those who have the most to gain in parenting knowledge, attitudes, and behaviors.

The next chapter reports evaluation findings regarding outcomes related to children's development, adaptive behaviors, and health. If the assumption inherent in the PAT program model—that changes in parenting behavior are key to improvements in child outcomes—holds, we would expect to see small effects on child outcomes for the participant group children overall, and stronger effects for children in the subgroups showing stronger parenting outcomes—that is, families with very low incomes and those in Site 2.

5 CHILD OUTCOMES

The ultimate goal of the PAT program is to improve outcomes for children, particularly in the area of child development. Here we discuss the impact of PAT on several aspects of child development and on children's use of health services.

For each of the outcomes measured, we compare the participant and control groups within the entire sample* at children's second birthdays.** Because the PAT program intends to serve families with children through at least age 3, these assessments are likely to underrepresent the full effects of PAT that might be measured at third birthdays. Along with measures of child outcomes, we present effect sizes, which express the difference between groups as a proportion of the combined standard deviation of the two groups. We also compare participant and control groups for children of very-low-income and more-moderate-income families and for children at each site; the backgrounds and experiences of families in the sites differed markedly in some ways that could have influenced their children.

Multivariate analyses of each outcome at the 2-year assessment then are presented to test the cumulative impact of the program on children, to that point. The multivariate analyses enable us to control for differences between the groups that were present for some subgroups despite random assignment. These control factors included mother's ethnic group, age, education, literacy behaviors, health, perceived social support, and previous experience with infants at enrollment; household income; whether children had siblings; children's health; and hours children spent in child care weekly. The significance of belonging to the participant rather than the control group, independent of the influence of these control factors, is discussed for each child outcome.

Child Development

Five areas of child development were assessed with the Developmental Profile II (DPII, Alpern, Boll, and Shearer, 1984): cognitive, social, communication, physical, and self-help. DPII scores are expressed as the average months difference between the chronological age of the child and his or her developmental age. A score of 2, for example, indicates that a child's development was 2 months ahead of his or her chronological age. A score of -1 indicates a 1-month lag in development. A second instrument, the Adaptive Social Behavior Inventory (ASBI), was administered with parents, who reported the frequency with which their children exhibited a variety of prosocial behaviors. (Please see the appendix for more details on these instruments.)

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* Readers are reminded that the participant group includes all those originally assigned to the group who could be located for assessment, regardless of whether they ever received home visits.

** Children's development was not assessed at first birthdays because we believed families had participated in PAT too short a time by then for impacts on children to be evident. Parent impacts were assumed to be the first effects that would occur, followed later by benefits to children from improved parenting.

DPII mean scores (Table 5-1) indicate that children in the full sample were from about 2 to about 6 months developmentally ahead of their chronological age across the five domains, with the smallest developmental advantage being in the cognitive domain and the largest advantage pertaining to self-help development. DPII scores were almost identical for the participant and control groups across all domains and both assessments. However, the ASBI scores demonstrated a small positive effect for PAT children (e.s.=.21). Interestingly, among the areas of child development in which parent knowledge was assessed, emotional development showed the only knowledge impact (Table 4-2), a fact that may relate to the strongest child outcome also being in the emotional/social behavior domain. Multivariate analyses controlling for differences in the characteristics of the children and their households confirm the weak results for child outcomes. The relationships between belonging to the participant group and dimensions of development were inconsistent in direction and very small, holding constant other factors included in the analyses.

Table 5-1
CHILDREN'S DEVELOPMENT AT SECOND BIRTHDAYS, BY INCOME LEVEL

	Participant Group	Control Group	Effect Size
All Assessed Children			
DPII average months differential			
Cognitive development	2.2	2.4	-.04
Self-help development	6.1	6.0	.02
Social development	4.9	4.9	-.01
Physical development	2.9	3.0	-.01
Communication development	4.9	4.5	.08
Adaptive Social Behavior Inventory score	72.3	70.8	.21
Very-Low-Income Children			
DPII average months differential			
Cognitive development	.3	.1	.07
Self-help development	4.3	5.5	-.23
Social development	3.4	2.8	.12
Physical development	1.6	.9	.12
Communication development	2.5	2.0	.12
Adaptive Social Behavior Inventory score	**70.8**	**68.5**	**.32**
More-Moderate-Income Children			
DPII average months differential			
Cognitive development	3.0	4.0	-.22
Self-help development	6.4	6.3	.02
Social development	5.2	6.2	-.22
Physical development	2.9	3.6	-.12
Communication development	5.9	5.8	.03
Adaptive Social Behavior Inventory score	73.3	72.6	.12
Sample size (DPII/ASBI):			
All families	109/104	157/155	
Lowest-income families	52/31	60/47	
More-moderate-income families	57/55	97/84	

Bold type indicates moderate and large effects.

As with many parent measures, scores for children in the very-low-income families were substantially below those of children from more-moderate-income families on all dimensions. For example, months differential on communication development was less than half as great for the poorest children, compared with their more-moderate-income peers. However, the effects for the poorest children were somewhat stronger and more consistent. Small positive effects were noted for these children on three of the five DPII measures, and a moderate effect was found on the ASBI score; one small negative effect was noted (self-help development). This contrasts with one small positive effect (the ASBI score) and three small negative effects for children from families with more moderate incomes.

Looking across sites (Table 5-2), we find that all developmental outcome scores were highest in Site 1. However, DPII scores show a lack of consistent positive impacts on children in both Sites 1 and 3, although a small positive effect on the social behaviors measured by the ASBI occurred in Site 1 (e.s.=.24). In contrast, in Site 2, small positive effects were noted in the self-help and communication domains (e.s.=.27 and .29). In addition, a moderate positive effect was achieved in the social domain (e.s.=.40), which is consistent with a moderate positive effect on the ASBI (e.s.=.41). It is interesting to note that parents in Site 2 demonstrated the strongest and most consistent benefits in parenting behaviors of the three sites, the vehicle through which benefits to children are expected to occur.

Children's Health Care

Reflecting the health-oriented component of the PAT curriculum (including screenings for hearing and vision), we explored the impact of PAT on children's use of health services. The focus on preventive care included measures of full immunization at various ages and whether children had received well-child care in the preceding 6 months. Medical treatment also was of interest. The extent to which children were treated for injury could reflect enhanced awareness among parents of child and home safety or a reduced propensity for physical abuse. A reduction in emergency room use could accompany reductions in the need for treatment for illness or injury, as well as the possibility of parents' more appropriately determining whether children's medical care needs were emergencies.

Because the extent of health care use, particularly well-child care, is strongly affected by health insurance, we first compared the percentage of participant and control group children who were insured; a difference in insurance could influence the rates at which the groups accessed medical care. Overall, about 80% of children were covered by health insurance (Table 5-3); participant group children were only slightly less likely than control group children to be covered by health insurance, suggesting that only a small difference in well-child care, favoring control group children, would be likely to result from differences in insurance coverage alone.

Table 5-2
CHILDREN'S DEVELOPMENT AT SECOND BIRTHDAYS, BY SITE

	Participant Group	Control Group	Effect Size
Site 1			
DPII average months differential			
Cognitive development	5.9	6.8	-.18
Self-help development	8.2	8.1	.02
Social development	7.6	8.8	-.19
Physical development	5.7	6.4	-.14
Communication development	7.7	8.3	-.08
Adaptive Social Behavior Inventory score	75.3	73.8	.24
Site 2			
DPII average months differential			
Cognitive development	.7	1.2	-.12
Self-help development	6.6	5.0	.27
Social development	**4.4**	**2.4**	**.40**
Physical development	4.8	4.5	.04
Communication development	4.6	2.9	.29
Adaptive Social Behavior Inventory score	**71.7**	**68.8**	**.41**
Site 3			
DPII average months differential			
Cognitive development	.5	.3	.11
Self-help development	4.5	5.2	-.14
Social development	3.3	3.8	-.11
Physical development	.1	.2	-.03
Communication development	3.1	2.8	.10
Adaptive Social Behavior Inventory score	70.6	70.0	.09
Sample size (DPII/ASBI):			
Site 1	34/32	47/46	
Site 2	25/22	35/35	
Site 3	50/50	77/76	

Bold type indicates moderate and large effects.

Looking at income differences, very-low-income children were somewhat less likely than others to have health insurance. More importantly, there were very different patterns in insurance coverage for children in the very-low- and more-moderate-income groups. Among children from very-low-income families, participant group children were more likely than others to have insurance, whereas the opposite was true for the more-moderate-income group, where control group children were more likely to be covered by insurance. Thus, we might expect very-low-income participant group children to be more likely than their control group counterparts to have had well-child care, and control group children in the more-moderate-income group to be more likely to have had such care than participant group children in that income category.

Table 5-3
CHILDREN'S HEALTH CARE AT SECOND BIRTHDAYS, BY INCOME LEVEL

	Percentage		
	Participant Group	Control Group	Effect Size
ALL ASSESSED CHILDREN			
Covered by health insurance	79.8	84.8	-.13
Saw doctor in past 6 months for well-child care	91.4	94.8	-.14
Was fully immunized for his/her age	26.3	19.0	.17
Was treated for injury in last year	5.5	11.0	-.20
Went to the emergency room in last year	38.5	50.6	-.24
VERY-LOW-INCOME CHILDREN			
Covered by health insurance	82.1	72.3	.24
Saw doctor in past 6 months for well-child care	**90.0**	**97.8**	**-.34**
Was fully immunized for his/her age	--	--	
Was treated for injury in last year	6.4	14.9	-.28
Went to the emergency room in last year	48.4	63.0	-.30
MORE-MODERATE-INCOME CHILDREN			
Covered by health insurance	**75.9**	**89.3**	**-36**
Saw doctor in past 6 months for well-child care	92.5	94.0	-.06
Was fully immunized for his/her age	**23.8**	**11.5**	**.33**
Was treated for injury in last year	5.5	9.8	-.16
Went to the emergency room in last year	32.7	38.6	-.12
Sample size (health care variables/immunization):			
All families	109/38	156/42	
Lowest-income families	28/9	46/11	
More-moderate-income families	47/21	83/26	

--Too few cases to report separately.
Bold type indicates moderate and large effects.

Among the full sample of children, there were small effects on the participant group on all four of the health care variables, although the direction was inconsistent. Regarding well-child care, there was a small negative effect on having had preventive care in the preceding 6 months (e.s.=-.14), consistent with the lower rate of health insurance coverage for participant group children overall. However, there was a small positive effect (e.s.=.17) on the rate of full immunization for participants. There also were small effects in the desired direction regarding medical treatment for injury and emergency room visits (e.s.=-.20 and -.24). Multivariate analyses confirm these results. The relationships between PAT participation and health care were inconsistent in direction and quite small; no relationships were statistically significant.

Although participant group children in very-low-income families were more likely than control group children to have health insurance, they were less likely to have had well-child care in the preceding 6 months (e.s.=-.34). Small effects in the desired direction also were noted for treatment for injury and emergency room use. Participant group children from more-moderate-income families had no apparent disadvantage because they were less likely to be covered by health insurance. They had a moderate positive effect on full immunization and no effect

regarding well-child care. There were small effects in the desired direction regarding treatment for injury and emergency room use.

Data for the three sites (Table 5-4) reveal substantial differences in the rate of children's insurance coverage, with children in Site 1 being significantly more likely to be covered by insurance than those in Site 3. Despite this fact, children in Site 3 were not substantially less likely to have received well-child care than those in Site 1; well-child care was received by 87% to 97% of children across the sites and groups. However, PAT participation appeared to be related positively to well-child care only in Site 1; Sites 2 and 3 had moderate and small negative effects, respectively. Site 3 was the only community in which enough parents were able to find children's immunization records to enable us to determine whether children were fully immunized. There, a moderate positive effect was noted (e.s.=.32). Regarding treatment for injury and emergency room use, consistent effects in the desired direction were noted in all sites, with small effects being recorded in Site 2 and Site 3.

Table 5-4
CHILDREN'S HEALTH CARE AT SECOND BIRTHDAYS, BY SITE

	Percentage		
	Participant Group	Control Group	Effect Size
Site 1			
Covered by health insurance	93.9	97.9	
Saw doctor in past 6 months for well-child care	94.1	89.4	.17
Was fully immunized for his/her age	--	--	
Was treated for injury in last year	**2.9**	**12.8**	**-.39**
Went to the emergency room in last year	38.2	46.8	-.17
Site 2			
Covered by health insurance	86.4	94.1	
Saw doctor in past 6 months for well-child care	**87.0**	**96.8**	**-.38**
Was fully immunized for his/her age	--	--	
Was treated for injury in last year	12.0	19.4	-.20
Went to the emergency room in last year	28.0	40.6	-.27
Site 3			
Covered by health insurance	67.4	72.7	
Saw doctor in past 6 months for well-child care	91.5	97.4	-.27
Was fully immunized for his/her age	**33.3**	**19.2**	**.32**
Was treated for injury in last year	4.0	6.5	-.11
Went to the emergency room in last year	44.0	57.1	-.26
Sample size (health care variables/immunization):			
Site 1	34/6	47/8	
Site 2	25/11	32/8	
Site 3	50/21	27726	

--Too few cases to report separately.
Bold type indicates moderate and large effects.

Summary

Developmental benefits to 2-year-olds participating in PAT in the Multisite Evaluation communities were quite weak for the sample overall. Small positive effects were noted only on the Adaptive Social Behavior Inventory. Health care use impacts were somewhat stronger, with small positive effects on being fully immunized for their age and reduced needs for treatment for injury and emergency room care. Some differences were noted for children in different income groups, although they were inconsistent in direction. Children from very-low-income families benefited slightly more than others on developmental measures, whereas those from more-moderate-income families had somewhat greater effects on the measure of immunization. Site differences in children's development were more pronounced, favoring Site 2, where there were moderate positive effects on two measures and small positive effects on two others. However, children there did not fare better than others on health-related measures.

These findings regarding child impacts for the Multisite Evaluation are reasonably consistent with findings from evaluations of several other home visiting programs, from which results also are mixed. For example, a research review by Olds and Kitzman (1993) found significant short-term program impacts on children's cognitive or behavioral development in fewer than half of the randomized trials they reviewed (e.g., Gutelius, 1972, 1977). Even programs that generated benefits to parents did not always result in benefits to children (Olds et al., 1986, 1988; Olds, 1992). An analysis of five quasi-experimental Child Survival/Fair Start programs demonstrated positive effects on cognitive development for only two home visit programs (Larner, Halpern, and Harkavy, 1992). The Texas PAT evaluation (Owen and Mulvihill, 1994) showed no differences in cognitive development for PAT children of highly educated mothers. Positive impacts on children's health also were sporadic (see for example, Olds, 1992; Field et al., 1982; Infante-Rivard et al., 1989). Where benefits to children did accrue, it is important to note that they often were associated with programs that had a center-based service component in addition to home visiting.

However, Multisite Evaluation findings regarding child impacts are weaker than those produced by evaluations of some other PAT programs. For example, an evaluation of the Missouri PAT program (Pfannenstiel and Seltzer, 1989) found significant positive effects at 36 months in children's cognitive and language development. The "second wave" study of PAT (Pfannenstiel et al., 1995) also showed benefits for older children, although neither study used an experimental design. The Northern California Parents as Teachers Evaluation (Wagner et al., 1999) did employ an experimental design and found significant cognitive gains for PAT children as measured by the DPII, but only for those of Latina mothers. Significant benefits to these children also were found in the language, self-help, and social domains, as well as in language development, as measured by the Peabody Picture Vocabulary Test for 3-year-olds. It is quite possible that children in the Multisite Evaluation communities did not demonstrate similarly consistent or positive gains because they were assessed as 2-year-olds rather than at age 3, when they would have completed the core PAT program. In addition, the fact that a substantial proportion of participant group families whose children were assessed did not actually receive home visits (please see Chapter 3) may have diluted the impacts of the program among those assessed.

6 DOES LEVEL OF PARTICIPATION MAKE A DIFFERENCE?

Previous chapters have presented findings from the Multisite Evaluation regarding the participation of families and the outcomes parents and children experienced. Outcomes were reported for all parents and children who were assessed, for those who were low income and who had more-moderate incomes, and for those in each site. Here, we extend our analysis to relate variations in the level of participation of families and the outcomes achieved by parents and children. We ask, "Did those who had greater exposure to PAT home visits experience greater benefits than those with a lower level of participation in the program?"

This question is particularly important in this evaluation because of the relatively large percentages of families in the participant group who never began home visits (22%), dropped out before children's second birthdays (almost 35%), and persisted through second birthdays but received fewer than the expected number of monthly home visits (31%). In fact, only about 12% of families in the participant group received monthly home visits through children's second birthdays.

Outcomes for parents and children that have been reported thus far incorporate this variation in program participation by reporting outcomes for all those assigned to the participant group, regardless of their actual level of participation. These outcomes should be interpreted as those expected for the program, given the variation in participation demonstrated by families in the evaluation.

However, these findings do not accurately depict what could be expected for families who participate in PAT more actively, particularly those who participate at the level for which the program was designed—monthly home visits. Because only a small minority of families assigned to the intervention actually participated in the program at this level, outcomes for the entire participant group could underestimate the benefits of the program for families who participated as intended.

We have used two strategies to examine the issue of whether greater participation in PAT was related to more positive outcomes. First, we used multivariate (i.e., multiple regression or logistic regression) analyses to relate the number of home visits received by participant group members to the parent and child outcomes they achieved, controlling for other differences between them.* These statistical controls are important because those with greater participation could differ from less-active participants in important ways that could affect outcomes, apart from the differences in their levels of participation. These multivariate analyses reveal the "added value" of each home visit to the outcomes for participant group parents and children.

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* Control variables for parent outcomes included mother's age, ethnicity, health, and perceived social support; household income; and whether the child had siblings. Control variables for child outcome analyses included the control variables from the parent outcome analyses plus the number of hours the child was in child care and the child's health. Child health analyses also included whether the child was covered by health insurance.

We took a second look at the question of level of participation by asking whether a threshold level of home visits is more likely to result in the desired outcomes. To address this question, we compared outcomes for a "high-dose" participant group and an adjusted control group constructed to match the characteristics of the high-dose group. Findings from these analyses are reported below.

Multivariate Analysis Results

Multivariate analyses do not provide overwhelming support for the notion that greater participation in PAT is associated with more positive outcomes across the board, controlling for other factors that distinguish more actively participating parents and children from those with lower levels of participation. For many outcomes, particularly parent outcomes, the relationship of intensity of participation to outcomes was not statistically significant (Table 6-1). However, stronger relationships are apparent for some variables, particularly child outcomes.

Participating in more home visits was associated with somewhat higher scores on the parent knowledge scale and the overall NCAST scale; both relationships were in the desired direction and approached statistical significance ($p<.08$ and .09, respectively). The relationship to the NCAST total scale resulted entirely from a statistically significant relationship to the NCAST child score, suggesting that children's responses to parents' teaching behavior was more positive as parents participated in more home visits. This is a particularly important outcome for parents because it is through their interaction with their children that benefits to children are expected to result.

Regarding child outcomes, significant relationships were found between intensity of home visits and children's cognitive and physical development ($p<.05$ and .001, respectively). Relationships in the desired direction also were found with children being fully immunized and needing treatment for injury, at levels approaching statistical significance ($p<.09$ and .07, respectively).

These findings suggest that more intense exposure to the PAT program curriculum and activities can result in stronger impacts on some dimensions for both parents and children, relative to impacts experienced by those who received fewer home visits, controlling for other differences between them. However, impacts were not consistent across all the outcome dimensions assessed.

"High-Dose" Comparison

A second analytic strategy involved defining a new "high-dose" participant group, consisting of those who received the expected rate of monthly home visits through children's second birthdays, and comparing it with a control group that matches the characteristics of the high-dose group. We defined the high-dose participant group as families who were active participants through children's second birthdays, who had a ratio of home visits to months participating that was at least 1.0—the equivalent of one visit per month during their period of participation—and who participated in the parent and child assessment at children's second birthdays.

Table 6-1
SIGNIFICANCE OF RELATIONSHIP BETWEEN NUMBER OF HOME VISITS AND PARENT AND CHILD OUTCOMES FOR PARTICIPANT GROUP FAMILIES

	Significance Level
PARENT OUTCOMES	
Parent knowledge scale	+ p<.08
PSOC parenting attitudes scale (total)	ns
Precursor of Child Maltreatment subscale score	ns
Language/literacy/numeracy-promoting behavior scale	ns
HOME language/literacy-promoting behaviors subscale	ns
Total HOME scale	ns
NCAST total scale score	+ p<.09
NCAST parent scale score	ns
NCAST child scale score	+ p<.01
CHILD OUTCOMES	
DPII average months differential	
Cognitive development	+ p<.05
Self-help development	ns
Social development	ns
Physical development	+ p<.001
Communication development	ns
Adaptive Social Behavior Inventory	ns
Percentage reporting child:	
Saw doctor in past 6 months for well-child care	ns
Was fully immunized for his/her age	+ p<.09
Was treated for injury in last year	- p<.07
Went to the emergency room in last year	ns

+, - = direction of relationship.

The full control group is an inappropriate comparison group for this subset of high-dose participants. High-dose participants do not include those whose circumstances and/or motivation limited their participation, making that group different from the control group in ways that could bias a comparison between them. In fact, a comparison of the full control group and the high-dose group showed that high-dose participants were older and higher income, less likely to be African-American, and more likely to be married and of excellent health.

To improve the legitimacy of the comparison between high-dose participants and the control group, we needed to define an adjusted control group that had characteristics very similar to those of the high-dose group. Because we did not have direct measures of intangible qualities, such as motivation, our criteria for selecting a subset of control group members to match to the high-dose group could include only demographic and contextual factors that were measured in the study. Further, many characteristics of families were interrelated, so that selecting control group members by one criterion also resulted in selection of members that were likely to have

other correlated characteristics. For example, selecting married members resulted in selection of a disproportionate number of older members and those with more than one child and higher incomes (because of the likelihood of dual incomes).

Weighing these factors, we created an adjusted control group by matching members on the racial/ethnic distribution, household income, marital status, and maternal health. A total of 80 control group members were included in an adjusted control group that mirrors closely the group of high-dose participants on these characteristics.

Table 6-2 depicts the characteristics of the high-dose participants and the adjusted control group. There are no notable or statistically significant differences between them on these characteristics. To the extent that intangible qualities, such as motivation to participate, are correlated with these kinds of demographic and contextual factors, the two groups are likely to be similar on those qualities, as well. Thus, we conclude that a comparison of the high-dose participants and the adjusted control group will provide an appropriate basis for concluding whether benefits of PAT participation are greater for those whose participation in home visits is at the expected level through children's second birthdays, relative to a similar group of nonparticipants.

Table 6-3 presents key parent and child outcomes at the second assessment for high-dose participants—those who received monthly home visits at least through children's second birthdays—compared with those for the adjusted control group, which was constructed to provide a good demographic match to the high-dose participants. The table compares the effect sizes for impacts on high-dose participants with the effect sizes reported in earlier chapters for the full sample of those assessed at children's second birthdays.

This comparison provides some corroboration of the findings of the multivariate analyses presented earlier, although not in all cases. Overall, changes in effect sizes generally were quite small and were as likely to be negative as positive, mirroring the selective, rather than consistent, impacts demonstrated in the multivariate analyses. Importantly for the potential influence on child outcomes, however, the NCAST total scale score increased markedly, from no effect for all participants to a moderate effect for more active participants (.09 to .33), as did the child score (-.07 to .29). Also, desired effects on child health variables were stronger among high-dose participants than among participants as a whole, with the effects on rates of full immunization and treatment for injury reaching statistical significance. This pattern is consistent with the findings of the multivariate analyses, further supporting a conclusion that there is a relationship between level of home visit participation and these outcomes.

Table 6-2
CHARACTERISTICS OF "HIGH-DOSE" PARTICIPANTS AND ADJUSTED CONTROL GROUP

	"High-Dose" Participants	Adjusted Control Group
Mother's age		
Average age	25.9	25.4
Percentage 30 or older	36.8	30.0
Mother's ethnicity (percentage)		
Caucasian/white	52.6	51.2
African-American	39.5	36.2
Hispanic/Asian/Other	7.9	12.5
Percentage not a high school graduate	31.6	37.5
Percentage of households with:		
Two married parents	55.3	47.5
Sibling(s) of enrolled child	26.3	26.2
Percentage with annual income of:		
Less than $15,000	50.0	45.6
$15,000 to $39,999	21.0	27.8
$40,000 or more	29.0	26.6
Percentage participating in TANF	8.1	7.7
Percentage working full or part time	41.9	43.5
Percentage who owned their home	39.5	36.7
Percentage who reported knowing "a lot" about babies	40.5	41.2
Average scale score for information seeking about children and parenting	9.2	9.3
Percentage strongly disagreeing that:		
"You can't hear yourself think in our home"	55.3	59.5
"This child puts a real strain on the family"	73.7	74.7
"It is a real 'zoo' in our home"	52.6	49.4
Percentage with "excellent" or "very good" health among:		
Mothers	81.6	81.2
Children	96.9	88.7
Sample size	38	80

Table 6-3
SUMMARY OF PAT PROGRAM IMPACTS AT 2-YEAR-OLD ASSESSMENT FOR THOSE WITH EXPECTED LEVEL OF HOME VISITS

	"High-Dose" Participants	Adjusted Control Group	Effect Size for This Comparison	Effect Size for All Those Measured
PARENT OUTCOMES				
Average score on:				
Parent knowledge scale	80.5	79.5	.08	.14
PSOC parenting attitudes scale	54.3	55.1	-.15	-.04
Precursor of Child Maltreatment subscale	19.3	19.0	.09	.01
Language/literacy/numeracy-promoting behavior scale	20.2	20.4	-.05	.09
Total HOME scale	**39.1**	**37.3**	.30	**.41**
NCAST total scale	**55.3**	**52.6**	**.33**	.09
NCAST parent scale	40.9	39.1	.29	.19
NCAST child scale	14.8	13.5	.29	-.07
CHILD OUTCOMES				
ASBI social development scale	73.5	72.1	.20	.21
Months differential in:				
Physical development	4.2	4.3	-.03	-.01
Self-help development	6.5	7.4	-.16	.02
Social development	6.7	6.5	.05	-.01
Cognitive development	4.4	4.2	.05	-.04
Language development	6.8	6.1	.10	.08
Percentage reporting child:				
Saw doctor in past 6 months for well-child care	88.9	91.0	-.07	-.14
Was fully immunized for his/her age	**45.4**	**11.1**	**.80***	.17
Was treated for injury in last year	**2.6**	**11.5**	**-.37***	-.20
Went to the emergency room in last year	**31.6**	**46.2**	-.30	-.24

Bold type indicates moderate and large effects. Statistically significant from the control group in a one-tailed test at the following level: * p< .05.

However, the relatively stronger relationship found in the multivariate analyses regarding the parent knowledge scale score was not mirrored in the comparison in Table 6-3. The relationships identified in multivariate analyses regarding children's cognitive and physical development also were not mirrored in the high-dose/adjusted-control-group comparisons; there continued to be no consistent pattern of child development benefits, even among high-dose participants. On other measures, the effect sizes were as likely to weaken as to strengthen. For example, the effect on the NCAST total scale increased to a moderate size among high-dose participants when compared with the full participant group (effect size increased from .09 to .33); however, the effect on the total HOME scale declined in size (from .41 to .30). Thus, results are inconclusive regarding the effects of level of participation on the majority of measures.

Summary

The two analysis strategies we pursued in addressing the issue of whether more intense participation in PAT resulted in more positive outcomes produced a mixed picture of results, suggesting that an unequivocal answer to this question is inappropriate. Relationships between intensity of participation and some parent and child outcomes were found, but they were few and weak, overall. The most consistent relationships were noted between intensity of home visits and both parent-child interactions, as measured by the NCAST, and child health care use, particularly rates of full immunization and treatment for injury. However, overall, we do not find evidence in these analyses to support the notion that the level of participation in home visits explains a significant portion of the variation in parent and child outcomes assessed in the Multisite Evaluation.

7 CONCLUSIONS

The Multisite Evaluation of the Parents as Teachers program has documented participation in PAT in three communities through children's second birthdays, and the outcomes achieved for parents and children for that period, compared with control group families. Differences between very-low-income and more-moderate-income families have been explored, as have differences between participating sites.

The findings of the evaluation point clearly to the difficulty of engaging and retaining the families recruited for the Multisite Evaluation. More than one in five families recruited for home visits declined to begin them; 35% began visits but dropped out of the program before children's second birthdays. Similarities between these rates of participation and those found in evaluations of other home visiting programs suggest that this is not a problem specific to PAT or these communities, but an issue facing the home visiting service sector as a whole (Gomby et al., 1999). Analyses of the characteristics of families that were associated with lower engagement indicate that racial/ethnic background and marital status are the two most powerful explanatory factors in understanding variations in engagement, when variations in factors such as mother's age and education and the family's household income were held constant. This finding suggests that the relatively high proportion of minority families in Sites 2 and 3 helps to account for their lower levels of engagement, and that the higher rate of married two-parent families in Site 1 helps to explain the higher engagement on all dimensions noted for that community.

The evaluation experiences also point to the difficulty of conducting evaluation research in real-world field settings, such as the programs and communities that participated in the evaluation. The difficulties experienced by the local programs in engaging and retaining families also frustrated local field evaluators in their efforts to assess families for the evaluation; only 64% could be located and convinced to participate in the assessments. Further, the fact that the local PAT programs were participating in the evaluation may, itself, have confounded their recruitment and retention difficulties, as described in Chapter 3.

Despite these difficulties, the evaluation was able to confirm a pattern of small positive benefits for parents on several dimensions associated with participation in PAT. For example, of 25 measures of parent impacts assessed, 12 showed positive effects, including 2 that were moderate in size; no negative effects were noted. The positive effects crossed all three dimensions of parent impacts: knowledge, attitudes, and behaviors. The most consistent positive effects were found for parenting behaviors, the domain in which 8 of 14 measures showed positive effects, including one that was moderate in size. This concentration of benefits in the arena of parent behaviors is good news, in that the conceptual framework that depicts the ways in which benefits to children are expected to accrue emphasizes parenting behaviors as the pathway for those benefits.

Notwithstanding these benefits to parents, effects on children were few and small. No benefits to children's development for the full sample were noted in any of the six developmental

domains measured by the Developmental Profile II; however, a small positive effect on a measure of children's social adjustment was found. Benefits in terms of children's health were suggested by the data, including a higher propensity to be fully immunized and a lower likelihood of accessing emergency room care or treatment for injury.*

These findings attest to the wisdom of having "modest expectations" (Gomby et al., 1999) regarding the impacts of PAT and other home visiting programs. Given the multiple and sometimes intense challenges faced by many families with young children, and the complex nature of the behavioral and developmental outcomes being addressed by the program, it is unreasonable to expect that dramatic differences in the behaviors of parents and development of children would result, even from sustained and consistent participation in a monthly home visiting program.

Findings regarding differences in effects for very-low-income and more-moderate-income families give further support to the wisdom of modest expectations. The local programs that participated in the evaluation were successful in recruiting a high proportion of families with low incomes and other factors that might put their children at risk for poor development. Measures of parent and child outcomes indicate that the lowest-income families had lower scores on virtually every dimension. It is tempting to assume that, with more room for improvement, PAT participation would have stronger or more consistent benefits for these families.

Notable benefits were found for the lowest-income families. For example, benefits in terms of parent knowledge were uniformly found only among the lowest-income families, and benefits were noted on 7 of 14 parent behavior measures for the lowest-income group, 2 of which were moderate in size. In addition, benefits in terms of child development were marginally more consistent for children of the lowest-income families, as were reductions in the need for emergency room treatment and treatment for injury. However, other benefits were as likely or more likely to accrue to more-moderate-income families. For example, benefits were found on nine parent outcome measures for the more-moderate-income group, with one being moderate and size and one being large and statistically significant. Thus, the evaluation findings suggest that PAT may be as effective, but not necessarily more effective, for the lowest-income families relative to those with more-moderate incomes. Given that the low-income population can be particularly difficult to affect, this conclusion is encouraging regarding the appropriateness of PAT for a wide range of families.

It is the site-level analyses that reveal the strongest and most consistent benefits of PAT participation, which occurred among families in Site 2. There, both parents and children were more likely than those in the other sites to show positive effects. Parent effects were particularly strong in the parenting behavior domain, where 13 of 14 measures showed positive effects, including 5 that were large and statistically significant. Children's developmental measures also were most consistently and strongly positive for those in Site 2.

Explaining this stronger showing in Site 2 is not straightforward. The PAT conceptual framework suggests that more-active participation and engagement would explain stronger

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* The rates of treatment were lower than those that might result from a slightly lower likelihood of having health insurance among participant group children relative to those in the control group.

benefits. However, Site 1 had stronger family participation and engagement on all measures than Site 2, yet it did not have stronger outcomes. In fact, two analysis approaches were used to address the question of whether more intense participation made a difference in outcomes, and the results were not conclusive. For example, when factors related to participation were controlled for (e.g., mother's age and ethnicity, household income), those with more intense participation were significantly more likely than others to have stronger outcomes on only 3 measures of the 19 examined, with 4 others approaching statistical significance.

Another programmatic explanation could relate to the organizational structure of the program in Site 2. As mentioned in the first chapter, the PAT program in this community was delivered by parent educators who worked for a variety of social service agencies, under the "umbrella" of a general family- and child-serving agency. Parent educators in this community had a wider variety of professional backgrounds than PAT parent educators usually represent, including several social workers. The programs and missions of several of the organizations involved providing a wider array of direct services, including case management in some instances, than PAT staff typically provide. In addition, data demonstrate that families in Site 2 were more likely than those in the other communities to have had contact with a variety of service agencies, particularly those related to parenting support, children's health, and health education. This greater access to other services that were supportive of parenting and children's development, through the PAT agency and/or other agency contacts, could have leveraged the PAT program impacts to produce greater benefits for parents and children in Site 2 than for those in the other communities. This explanation would suggest that PAT is particularly effective when it is one of a portfolio of community services that are available to and accessed by families.

In addition, it is interesting to note that the local program in Site 2 was the only program to meet its recruitment goal for the number of families to enroll in the evaluation. Although there could be a variety of reasons for their unique success, one potential explanation could be a generally higher level of management effectiveness in that organization.

Finally, the characteristics of families served in Site 2 may have contributed to their stronger showing in the evaluation. Mothers in Site 2 were more likely than those in the other communities to have graduated from high school and to be African-American. They also were significantly less likely to be of excellent health, as were their children. And families in Site 2 were less likely to be very low income. Although these factors distinguish participants in Site 2 from others, it is not at all clear whether or how they help explain the more consistent and stronger positive effects of PAT participation in that community.

It is important to note, in coming to a conclusion about the effects of PAT, that the programs being evaluated here differ from the typical PAT program in several important respects. All are large programs in urban areas, which are not characteristics of the majority of PAT programs. In addition to the confounding effects of being part of the evaluation, the programs in these communities have been evaluated only through children's second birthdays, in large part because attrition from the programs was so substantial that an insufficient number of families were likely to be retained through third birthdays to justify additional measurement.* Thus, the impacts reported here do not reflect those that might be achieved from full participation in PAT through children's third birthdays. The fact that the evaluation could not be maintained to the program's conclusion, because of engagement and retention obstacles, underscores the crucial nature of the issue of participation for continued improvement of PAT and other home visiting programs.

* The exception to discontinuing evaluation at children's second birthdays is Site 1, where retention in the program is better and the sample is likely to be sufficient for further assessment at third birthdays.

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APPENDIX
EVALUATION METHODS

Below, we describe the methods used to answer the evaluation questions posed in Chapter 1. We address the following topics:

- Design overview
- Sample development and maintenance
- Data collection instruments
- Data collection procedures
- Participation in and timing of data collection
- Data analysis approaches

Design Overview

The PAT Multisite Evaluation is being conducted in three geographically dispersed sites. SRI worked with the PAT National Center staff to use its management information system to identify programs from which to draw the study sample. Selected sites were those that had been in operation for at least 2 years, could provide services to a minimum of 100 new families annually, served a high proportion of low-income families; and offered home visits at least monthly. Sites were visited by PAT National Center staff, who certified that the local programs were appropriate examples of the PAT model.

The evaluation design chosen for the PAT demonstration in these three communities needed to be rigorous enough to produce persuasive findings that could hold up under scrutiny in both the scientific and policy arenas. An experimental design is the most rigorous evaluation design and was the one employed in the demonstration. The central feature of this design was that clients in each community were randomly assigned to a participant and a control group so that the groups would be essentially equal at the outset; differences in outcomes then could be attributed with reasonable confidence to participating in the PAT program. By comparing participants in PAT with a control group, we could determine whether PAT was more effective in helping parents and children achieve positive outcomes than the community services that families might engage in on their own.

The demonstration has taken place over 3 years.* Families with infants up to 8 months of age were recruited over a 1-year period. All recruited families were randomly assigned to the participant or control group in their community. The participant group was offered monthly home visits and other PAT services for as long as they chose to remain in the program, up to "graduation" at children's third birthdays. The control group received only the services that normally were available in their community and that they sought at their own initiative. Control group members also received age-appropriate toys through the mail at regular intervals, as a way of tracking the location of families (see discussion of tracking below). Both groups received annual child assessments at or around children's birthdays.

The core of the evaluation involved rigorous quantitative measurement of the parent and child outcomes suggested in the conceptual framework presented in Chapter 1. The large majority of data were collected through in-home assessments conducted by "field evaluators" who were hired, trained, and supervised by SRI and who were "blind" to the group to which families belonged. The analysis strategy involved comparing outcomes between participant and control group members for the demonstration overall and in each community so that the effects of community context and program differences could be identified. Analyses involved both univariate descriptions and multivariate statistical models that controlled for differences between the two groups for the sample overall and for each community. In addition, we explored the extent to which the effect of the intervention varied with aspects of the intervention, such as the length and degree of participation of families.

Sample Development and Maintenance

Developing the Sample

Recruitment of families into the demonstration was the responsibility of local programs; recruitment is described in Chapter 3. A total of 697 families were recruited across the three sites. When families were recruited for the demonstration by PAT staff, they were asked to sign a consent form that described two forms of service: PAT home visits and in-home child assessments (Group A), and in-home child assessments and regular receipt of free toys (Group B). Signing the consent form indicated that a parent understood that not all families could be in each group and that a lottery system would be used to assign families to the groups. Consent forms were transmitted to SRI, where families were randomly assigned, with a 40% probability of being assigned to the participant group and a 60% probability of being assigned to the control group. This unequal probability of assignment favoring the control group reflected the limitations in the number of new families that could be served by the local programs.

At SRI, an identification number was assigned to each client. The name, identification number, and group assignment then were communicated to PAT program staff, who contacted each family to inform them of their assignment. Enrollment information was obtained either at

* Although families are served until children are at least age 3, and the demonstration was planned to continue until that time, only in Site 1 will the evaluation continue through assessment at children's third birthdays. Largely because of difficulty in retaining families in both the program and the evaluation, the decision was made by the funders of activities in two of the three sites to discontinue the evaluation after the second assessment.

the time parents signed the consent form or, in some cases, when they were notified of their group assignment.

Tracking

Retaining the maximum number of participants in the evaluation was among the evaluation's highest priorities. Although some attrition is experienced by every program and every evaluation, the validity of the PAT evaluation findings would be enhanced if the groups that had their outcomes assessed corresponded as much as possible in size and characteristics to the original groups that were recruited. Thus, we sought to assess all enrolled families, whether or not they continued participation in the program. SRI implemented a client tracking system to support the goal of assessing the maximum feasible number of demonstration families, as described below.

Participant Group

Tracking participant group members was primarily the responsibility of PAT program staff. Parent educators had regular contact with families in the process of scheduling and providing home visits. When an attempt to contact a parent by phone failed because the phone was disconnected, PAT staff visited the last known address of the family. If the family had moved, inquiries were made of the neighbors and other clients who knew the family in an effort to locate a new address or telephone number. If staff determined that a family had left the community, they notified SRI that the family had been dropped from the program and indicated whether new contact information was available for them. If a family was still living at the known address, efforts to contact them were maintained for 3 months in an effort to provide services. If the parent was repeatedly unavailable for appointments, or stated she was no longer interested in participating in the program, the staff notified SRI that the family was no longer active.

Although SRI field evaluators sought to assess all PAT enrollees, regardless of whether participant group members were active in the program, the evaluation monitored closely each client's status as a participant or dropout from the group to which s/he was assigned. When the program notified SRI that a family was no longer active, staff reported the date and the reason the family no longer was receiving services. In some cases, the program maintained families on the active list for many months, even when the family did not participate in any services in that time period. Although some families reconnected with the program after a prolonged period of inactivity, many others were never reinstated in the program. Allowing a prolonged period of inactivity before dropping a family had the effect of artificially extending the participation period of the family and depressing calculations of intensity of services received, which are central to the findings reported in Chapter 3. In such cases, we removed the parent from the active list and designated her as a dropout effective 3 months after the date of the last service she received, thereby truncating the client's enrollment period at a reasonable point after services were discontinued.

Control Group

Tracking control group members involved monitoring each family's response to receipt of developmentally appropriate toys that were sent to control group mothers quarterly by the PAT program. A postcard was included with each toy, along with instructions to mail the stamped, self-addressed postcard to SRI to acknowledge that the toy was received. On the postcard, the

parent was asked to verify her name, and space was provided to indicate a change in address or phone number.

Monthly, SRI generated a list of mothers to be sent a toy; mothers appeared on the list if it had been 3 months since they were last sent a toy and the postcard confirming its receipt was returned to SRI. The list was forwarded to the PAT program with an appropriate number of response postcards to include with the toys. Program staff sent a toy to each parent indicated on the list. When parents received the toy, they mailed the postcard to SRI. Upon receipt of the postcard, SRI recorded that the toy was received and updated the address list as appropriate.

Two alternatives to this scenario triggered more active efforts to locate a family. If the toy package was returned by the post office as undeliverable, a "tracker," hired and supervised by SRI, attempted to locate the family through phone contacts, visits to the last known address, or inquiries of others who knew the family. If the tracker confirmed that the family could not be located, she notified SRI that the parent was no longer an active control group member. Similarly, if neither the package nor the postcard was returned by the client within 2 months, SRI notified the tracker to initiate location procedures, as described above. At children's birthdays, all families were sought again for assessments at children's birthdays.

Data Collection Instruments

Each of the instruments identified used in the evaluation is described briefly below.

Family enrollment form. This form was completed by the parent educator who recruited a family, either at recruitment or when the family was informed of their group assignment. The form included information contained in the standard enrollment form suggested for use by the PAT National Center, as well as information requested specifically for the evaluation. The form gathered information about parent and child characteristics, such as ethnic background, parental age, family composition, and parent's school and employment status. If items on the form could not be completed at the time of enrollment (e.g., the birth date of the child if the mother had not yet delivered), they were completed during the first few months of participation.

Mothers' Previous Experience with Infants questionnaire. This questionnaire determined the extent to which mothers had been involved with infants or child care activities in the past. This information has been used to assess whether the intervention and control groups were comparable at the outset on this dimension. It also helped parent educators calibrate how knowledgeable mothers were, in order to determine the starting point for PAT instruction. Items on the questionnaire were borrowed from the Catalogue of Previous Experience (COPE) developed by MacPhee (1989), which in turn reflected research of Clarke-Stewart (1978) and Ninio (1979). The five-item written questionnaire was available in English and Spanish and was either read and completed by the mother or read aloud by the PE, who then recorded the mother's responses on the questionnaire.

Family survey. This form updated several kinds of information originally obtained at enrollment. The information recorded on the form was obtained from a parent by the SRI field evaluator at the time of the in-home assessments at children's birthdays. It ascertained the

family's use of child care, the parents' employment and education status, the mother's pregnancy status and childbearing experience in the previous year, the family's household composition, receipt of public assistance, and use of health care services.

Parenting knowledge items. Items assessing parents' knowledge of the kinds of parenting and child issues covered in the PAT curriculum were included in the Family Survey. Staff of the PAT National Center and SRI reviewed a variety of existing instruments that assess different aspects of parent knowledge, but did not find any single instrument that focused exclusively on key dimensions of the PAT curriculum, a correspondence that is important if the instrument is to identify what may be subtle differences in the knowledge of PAT and control group parents. Therefore, we constructed a parent knowledge instrument from items contained in other instruments, particularly the Knowledge of Infant Development Inventory (KIDI; MacPhee, 1989) and the Adult-Adolescent Parenting Inventory (AAPI; Bavolek, 1984). Different versions have been constructed for the two assessment points, so the items are particularly relevant to the age of the child.

Parenting Sense of Competence (PSOC) Scale. This 17-item questionnaire, developed by Gibaud-Wallston and Wandersman (1978), has been used in other research to assess the attitudes of parents of both infants (Wandersman, Wandersman, and Kahn, 1980) and older children (Mash and Johnston, 1983; Johnston and Mash, 1989). The written questionnaire was available to parents in both English and Spanish. As with the KIDI, parents either read and completed the questionnaire themselves, or the field evaluator read the items aloud and recorded parents' verbal responses.

The items are statements about parenting that parents indicated were "very true for you, somewhat true for you, not very true for you, or not at all true for you." Items include both positive statements about parenting (e.g., "Being a parent is manageable and any problems are easily solved") and negative statements (e.g., "When I go to bed at night, I feel I haven't accomplished much"). Each item is given a score from 1 to 4, with the highest score given for the most positive attitudes (i.e., agreement with positive statements or disagreement with negative statements). Three scales are created from the PSOC.

Maternal Social Support Index. We consider the mother's sense of social support to be an important context variable for understanding their participation in PAT and, potentially, the outcomes achieved by mothers and children. Imbedded in the Family Survey are 21 items that comprise this index (Pascoe et al., 1988). The index evaluates the quantity and quality of social support available to mothers, as reported by them. The seven dimensions tapped in the index include help with daily tasks, satisfaction with visits from relatives, help with crises, emergency childcare, satisfaction with communication from a male support figure and from another adult, and community involvement. The validity and reliability of the index have been established (Pascoe et al., 1988). The scale has been found to correlate strongly with tendencies toward abusive behavior on the part of parents (Chan, 1994).

Adult-Adolescent Parenting Inventory (AAPI). Because presenting positive alternatives to corporal punishment as a disciplinary approach is an important element of the PAT curriculum, we were interested in assessing the extent to which parents who participated in PAT came to eschew physical discipline in raising their children. Included among the knowledge items in the

Family Survey are six items that comprise a subscale from the AAPI (Bavolek, 1984) regarding views of corporal punishment. Parents reported their reaction to items that favored corporal punishment of children, using a scale ranging from strongly agree to strongly disagree.

Language- and literacy-promoting behavior items. Encouraging behaviors that promote children's language development and early literacy are featured prominently in the PAT curriculum. To assess the impacts of the program on these parenting behaviors, we constructed a literacy subscale from the HOME that includes items that focus on parental encouragement of language and literacy (items 1, 2, 3, 18, 34, 36, 42, and 45). In addition, the Family Interview includes five items related to the parents' own literacy-related behaviors and six items regarding their encouragement of children's language development, literacy, and numeracy.

Home Observation for Measurement of the Environment (HOME). We used the version of the HOME instrument that was designed for families of children ages birth through 3 years to assess the home environment and parenting behaviors of enrolled families. The 45 items of the HOME were completed by the SRI field evaluator in the home of enrolled families. The HOME includes some items that the field evaluator assesses using direct observation (e.g., "Mother spontaneously vocalizes to the child at least twice during the visit, excluding scolding") and some that solicit information from the parent through informal conversation (e.g., "Someone takes child into a grocery store at least once a week"). The HOME score is obtained by assigning a value of 1 for every item answered positively during the assessment.

We examined the total HOME score as well as values for five subscales developed by its authors). In addition, we created a subscale of items related to literacy- and language-promoting behaviors, which are a particular emphasis of PAT (Winter and Rouse, 1991).

The HOME has a high level of interrater reliability, indicating that the level of judgment required of the administrator is straightforward enough that different people tend to evaluate a given family's circum-stances similarly 90% of the time (Bradley, 1985). HOME scores taken when a child is a year old also have been found to be highly correlated with IQ scores of children when they reach 3 years of age (Bradley, Caldwell, and Rock, 1989). The correlation of the HOME total scale score at 12 months of age and IQ at age 3 (measured with the Stanford-Binet Intelligence Test) was .55 ($p<.01$).

Nursing Child Assessment Satellite Training (NCAST). The teaching scale from the NCAST (see http://www.son.washington.edu/centers/ncast) was used at children's second birthdays to assess mother-child interactions, a key dimension of parenting behavior. (No measurement was taken at first birthdays because we did not believe sufficient change in parent-child interactions would have occurred by that time to warrant this fairly extensive and expensive measurement.) This measurement involves having a trained observer ask a mother to introduce a new toy to her child and record the interactions of the mother and child in the process of exploring the new toy. Dimensions include such factors as cue-giving and responsiveness to cues of both the parent and child.

Developmental Profile II (DPII). The DPII (Western Psychological Services, 1984) measures multiple aspects of a child's development (physical, self-help, social, academic/cognitive, and communication), as reported by his/her parent and observed by the field

evaluator during an in-home assessment. For each aspect of development, the DPII contains several items that describe skills children can perform, in 6-month age ranges, beginning at birth and continuing through age 9. The field evaluator began with the earliest skills she assumed the child could perform. If the child could not perform one of the skills at that level, the evaluator moved to the next earlier skill level. Skills were assessed at increasingly higher age levels until the child could not perform any of the skills included at two consecutive age levels.

Some of the 186 skills assessed across the age range of the DPII could be assessed by using direct observation (e.g., grasping with one or two fingers as opposed to the whole hand). Other skills relied on parents' reports of children's abilities (e.g., "Does the child use a spoon without help and with very little spilling?"). For PAT evaluation purposes, scores are presented as the difference in months between a child's chronological age and the age corresponding to the skill level assessed. For example, if a child was 12 months old but had the physical skills of a 15-month-old, the physical age score would be +3, or a positive differential of 3 months. If the child had the physical skills of a 9-month-old, the physical age score would be a negative 3.

Adaptive Social Behavior Inventory (ASBI). Mothers were asked to assess their child using the ASBI (Scott and Hogan, 1987), which was incorporated in the Family Interview. This instrument assesses the extent of prosocial and antisocial development of children.

Immunization status. During the in-home assessments, SRI field evaluators asked parents whether they had the "yellow immunization card" used throughout the state to record immunization histories. If the parent was able to locate the card, the date and type of each immunization were recorded. Field evaluators were not instructed to collect immunization histories until many children had already received their first-year assessments. Thus, immunization data reported in Chapter 5 are only for children at least 2 years old and those whose mothers could furnish the immunization card.

Program records. PAT parent educators used the Personal Visit Record to document contacts with families. This record included: dates and contents of PAT home visits (including the lesson topic, which handout was provided, and the activity engaged in with the parent or child); dates of PAT group meetings attended; dates of phone contacts with parents; and referrals made to other agencies. They were completed by PEs after each contact with a family. Information was then provided to SRI directly from case files or was abstracted from files by SRI staff. From this information, we calculated the intensity with which participants were involved in PAT activities, the timing of those activities, and home visit content (see Chapter 3).

Data Collection Procedures

Data were collected about children and families through in-home assessments at or around children's first and second birthdays and by abstracting information from home visit records. Procedures for each are described below.

Conducting In-Home Assessments

The majority of information about parents and children was gathered through in-home assessments conducted by field evaluators who were hired, trained, and supervised by SRI. Selected field evaluators had had previous experience with children, demonstrated attention to detail, and were responsible enough to work independently.

Training of field evaluators consisted of an initial 2-day session for first year assessments. Two to three additional days of training were added for second-year assessments because the NCAST was added to the assessment protocol.

The first-year assessment training included a presentation of the goals of the evaluation, discussion of the assessment instruments (HOME, parenting knowledge and attitude items, and the Family Survey) discussion of methods of establishing rapport with the parent, and instructions on the importance of maintaining an objective and neutral position during the interview. The trainees watched a video presentation of an in-home assessment, followed by a discussion of the scoring of each instrument.

The second day of the initial training began with a review and a question and answer period. A second in-home assessment video was presented and discussed. Trainees then went out in the field with trainers and conducted practice interviews with non-study participants. Each trainee was observed by one of the trainers. In the afternoon of the same day, the trainers led a discussion of each dyad. A third video was presented, during which the trainees scored each instrument. Individual scoring was discussed, with emphasis on establishing agreement on discrepant items. The session concluded with a presentation of appointment setting procedures, and processing and review of data.

For the second-year assessment, 2 to 3 days were added to the training. The first day of this session an overview of the NCAST was given, then trainees observed practice videos, and completed some reliability exercises. The second day of the NCAST training, the trainees took the NCAST test to be certified to give the NCAST to evaluation participants. The results of the tests were sent to NCAST to be scored and to have certification issued. After completing the testing, trainees went out into the field and conducted practice interview, which were observed by trainers.

As a follow-up to the training, each field evaluator conducted three practice interviews with families in the community to become familiar and comfortable with the use of the instruments. The scored instruments were reviewed by the project coordinator, and feedback concerning the completion and scoring of each instrument was provided. New field evaluators accompanied veteran field evaluators on at least one interview that was conducted with study participants.

Field evaluators conducted assessments in the homes of enrolled families after arranging appointments for that purpose with them. As children approached their birthdays, parent educators of participant group families were asked to alert their clients to the fact that a field evaluator would be contacting them for the assessment and to let them know the name of the person they should expect to hear from. Approximately 2 months before the birthday of an enrolled child, the SRI field evaluator sent a letter of introduction to each parent announcing the

need to schedule the assessment. Parents were asked either to contact the PAT program or to return the postcard enclosed with the letter to report any address or telephone number changes. Space also was available on the card for parents to indicate good times to be contacted and places where messages could be left for them. The letter and postcard were available in English and Spanish.

Approximately 6 weeks before each child's birthday, the SRI field evaluator telephoned each parent to schedule a visit. If a participant group parent was repeatedly unavailable to schedule an appointment or was otherwise difficult to contact, the SRI field evaluator contacted PAT program staff to request assistance in contacting the client and also sent a second letter and postcard to the parent. In the case of participant group members, if these measures did not result in a scheduled assessment appointment, the SRI field evaluator submitted a Scheduling Request Form to the PAT program for the parent educator of the client to schedule the assessment for the field evaluator.

No incentive payments were offered parents for assessments at children's first birthdays. However, because we were unable to complete assessments with several parents who could be located, we obtained funds that enabled us to offer $20 gift certificates to a local mall as an incentive to parents to complete assessments. As a result, the number of families for whom we completed assessments increased in year 2, despite the fact that more families moved from the community over time.

When an assessment appointment was scheduled, the SRI field evaluator sent the parent a postcard (in her language) confirming the date and time of the assessment. If the family had a telephone, both 1 week before the assessment and the day before the assessment, the SRI field evaluator telephoned the parent to remind her of the appointment. When a parent missed a scheduled appointment, the SRI field evaluator followed the procedures for hard-to-contact clients listed above.

The assessment battery for first and second birthdays was administered in approximately 1.5 hours; at third birthdays, the assessment was marginally longer because of the addition of the Wasik Problem-Solving Rating Scale and the Peabody Picture Vocabulary Test to the measurement battery. After completing an assessment, the field evaluator reviewed the instruments for completeness and clarity, copied the forms, and mailed them to SRI for entry into the computer database.

Field evaluators were "blind" to the group assignment of the families for whom they did assessments, in that they were given no information on assignments by the PAT program or by SRI. However, it is possible that parents made reference to receiving toys or home visits that would reveal their assignment. Because the field evaluators were in no way linked to the PAT program, we did not expect that a knowledge of group assignment would effect measurement. Nevertheless, we wanted to understand the extent to which field evaluators might know the assignment of families they assessed. Thus, they were asked to record at the end of each interview whether each family belonged to the participant or control group.

Table A-1 indicates that, generally, field evaluators were not particularly accurate in their speculation regarding group assignment of families. By chance, we would expect evaluators to

guess group assignment correctly 50% of the time. Field evaluators did not much exceed random chance in correctly identifying participant group members at the time of the first assessment. However, they were more likely to correctly identify control group members, particularly at the first assessment. Again, it is unlikely that this knowledge would systematically influence the results of field evaluators' assessments. Accuracy rates dropped markedly at the second assessment, when assessors were given the option of recording "can't decide," an option not provided at the first assessment.

After the second assessment, the results of the DPII were reported to parents. If a child was assessed with below-normal development, the assessment letter encouraged the parent to share the results with a health care professional for further advice. PAT program staff also were notified of below-normal assessment results for participant group clients.

Families who participated in the first assessment were reimbursed $20. To encourage greater cooperation with assessments, the "thank you" payment was raised to $30 for the second assessment.

Table A-1
DATA COLLECTOR SPECULATION ON GROUP ASSIGNMENT OF FAMILIES, BY CHILD'S AGE

	Participant Group		Control Group	
Accurately Identified:	Percentage	Sample Size	Percentage	Sample Size
At first assessment				
All enrolled families	56.0	144	70.5	193
Site 1	55.9	34	75.5	53
Site 2	61.2	49	88.3	77
Site 3	54.1	61	44.4	63
At second assessment				
All enrolled families	18.4	109	35.8	159
Site 1	23.5	34	44.7	47
Site 2	.0	25	68.6	35
Site 3	24.0	50	15.6	77

Participation in and Timing of Assessments

As mentioned previously, the evaluation sought to assess every sample member in the evaluation within 2 weeks of each child's birthday, regardless of whether participant group members continued to be active in service and regardless of whether the family left the community. Here, we discuss the rate and timing of participation in assessments.

Rates of Participation in Assessments

Table A-2 indicates the number of families for whom in-home assessments were completed at each time point. A generally low rate of cooperation with assessments was achieved, despite the extensive tracking efforts described earlier in this appendix. Many families who could be located simply were unwilling to participate in the assessments, despite the payments offered. Levels of cooperation decline over time, with generally lower rates of participation in the second assessment than the first.

Participation in the first assessment was lowest in Site 1 (45%) and highest in Site 3 (58%). Site 3 retained that level of participation in the second assessment, whereas a substantial drop was noted in Site 2 (from 52% at the first assessment to 24% at the second assessment.

Differences between sites in the rates of assessment participation reflect, in part, differences between participants in those communities. For many of the same reasons that parent educators had difficulty gaining cooperation with home visits among a large percentage of enrolled families, field evaluators had difficulty securing cooperation with assessments. Differences

Table A-2
NUMBER AND PERCENTAGE OF ENROLLED FAMILIES ASSESSED, BY SITE

	All Enrolled Families		Site 1		Site 2		Site 3	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
First birthdays								
Total	345	51.7	92	44.7	127	51.8	126	58.3
Participant group	148	53.6	36	43.9	50	51.0	62	64.6
Control group	197	50.4	56	45.2	77	52.4	64	53.3
Second birthdays								
Total	268	40.2	81	39.3	60	24.5	127	58.8
Participant group	109	39.5	34	41.5	25	25.5	50	52.1
Control group	159	40.7	47	37.9	35	23.8	77	64.2

among sites also reflect differences between the field evaluators and trackers hired in those communities. Despite consistent supervision and monitoring, some evaluators and trackers simply were more persistent and effective than others in locating families and securing their cooperation. Because the field evaluator position was part-time for most field evaluators, the duties of that role often competed with the demands of a second job, and some field evaluators had trouble completing assessments with the time available. Turnover among field evaluators and the difficulty of hiring replacements in some communities (despite raising the hourly rate twice) also left time periods in which only one assessor was working in some communities.

Over the life of the demonstration, 64% of enrolled families participated in at least one assessment (see Table A-3), ranging from 58% to 85% across sites and groups. A much smaller percentage of families participated in both assessments. Of those who participated in any assessment, only 44% of participant group and 42% of control group families participated in both of them. The rate of dual assessment participation was considerably higher in Site 3 than other communities.

Thus, the sample of participant and control families in each assessment year constituted half or fewer of all those enrolled, raising questions of how representative the assessed groups are of the full sample. Further, each of the assessed groups in a given year has members that do not appear in other years. This introduces the possibility of some instability in measurement resulting from shifting group membership. The issue of group equivalence in dealt with in depth in Chapter 2, revealing no statistically significant differences between the participant and control groups for the full sample at either assessment, and only a handful of differences between groups in specific communities. These differences are accounted for through statistical controls in multivariate analyses, reported in Chapters 4 and 5.

Table A-3
STABILITY IN GROUP MEMBERSHIP ACROSS ASSESSMENTS

Families Participating in Assessments (Number and Percentage)	All Enrolled Families		Site 1		Site 2		Site 3	
	Participants	Controls	Participants	Controls	Participants	Controls	Participants	Controls
No assessment	**98 (35.5%)**	**140 (35.8%)**	**29 (35.4%)**	**51 (41.1%)**	**39 (39.8%)**	**61 (41.5%)**	**30 (31.2%)**	**20 (14.8%)**
Any assessment	**178 (64.5%)**	**251 (64.2%)**	**53 (64.6%)**	**73 (58.9%)**	**59 (60.2%)**	**86 (58.5%)**	**66 (68.8%)**	**115 (85.2%)**
Total	**276 (100%)**	**391 (100%)**	**82 (100%)**	**124 (100%)**	**98 (100%)**	**147 (100%)**	**96 (100%)**	**135 (100%)**
Both assessments	**79 (44.4%)**	**105 (41.8%)**	**17 (32.1%)**	**30 (41.1%)**	**16 (27.1%)**	**26 (30.2%)**	**46 (69.7%)**	**49 (53.3%)**
One assessment	**99 (55.6%)**	**146 (58.2%)**	**36 (35.8%)**	**43 (58.9%)**	**43 (72.9%)**	**60 (69.8%)**	**20 (30.3%)**	**43 (46.7%)**
Year 1 only	69 (38.8%)	92 (36.6%)	19 (35.8)	26 (35.6%)	34 (57.6%)	51 (59.3%)	16 (24.2%)	15 (16.3%)
Year 2 only	30 (16.8%)	54 (21.5%)	17 (32.1%)	17 (23.3%)	9 (15.2%)	9 (10.5%)	4 (6.1%)	28 (30.4%)
Total	**178 (100%)**	**251 (100%)**	**53 (100%)**	**73 (100%)**	**59 (100%)**	**86 (100%)**	**66 (100%)**	**92 (100%)**
Percentage assessed in a given year who were assessed in both years:								
Year 1	53.4	53.3	47.2	53.6	32.0	33.8	88.5	76.6
Year 2	72.5	66.0	50.0	63.8	64.0	74.3	92.0	63.6

Timing of Assessments

We intended to conduct assessments within 2 weeks of children's birthdays. However, scheduling difficulties due to staff availability and a high number of "no-shows" (which required rescheduling of assessments at a later time) resulted in a broader spread in the timing of assessment, as shown in Table A-4. Although the average age at the first assessment was just over 12 months old, assessments ranged from almost 3 months before children's birthdays to almost 6 months after children's birthdays. Assessments were somewhat more delayed for 2-year-olds, who were just over 25 months of age, on average, at the assessment, with a similar spread in months before and after birthdays. The percentage of families assessed within 2 weeks of children's birthdays decreased from more than 50% for both groups at the first assessment to 37% and 43% at the second assessment.

There were no substantial site differences in the percentage of families assessed within 2 weeks of children's birthdays, with the exception of the participant group in Site 1 at the first assessment, which had significantly fewer families assessed on schedule than did the control group (28% vs. 52%, $p<.05$). This resulted in a participant group with a significantly higher average age than the control group in that site (13.6 months vs. 12.6 months, $p<.01$). Differences in age at assessment are not expected to significantly affect parent outcomes. Child outcomes were measured only at the second assessment, so are unaffected by the difference in Site 1 at the first assessment. Further, developmental measurements are adjusted for the age of children by focusing on the differential between the developmental and chronological age of the children.

Data Analysis Approaches

Analyses of the PAT demonstration findings involved both descriptive and multivariate approaches, as described below.

Descriptive Analysis

The majority of findings reported here involve descriptive statistics—percentages of clients with particular characteristics or outcomes or averages for groups, such as the average age of clients at enrollment. These descriptive statistics are presented for the participant and control groups to permit the comparison of the characteristics of the groups and their outcomes. For outcomes, we also indicate the "effect size" of that difference. An effect size indicates the magnitude of the difference between the participant and the control group in terms of the proportion of a standard deviation of the control group for the variable being considered. For example, an effect size of .33 for the participant group means that the value for that group was one-third of a standard deviation (of the control group) larger than the value for the control group; a negative number of the same size indicates that the intervention group value was one-third of a standard deviation smaller than the control group. Effect sizes often are used when

Table A-4
AGE OF CHILDREN AT IN-HOME ASSESSMENTS

Children's Age[1] at Assessment	All Enrolled Families		Site 1		Site 2		Site 3	
	Participants	Controls	Participants	Controls	Participants	Controls	Participants	Controls
1-year-old assessment								
Percentage of children who were:								
11 months old or younger	9.5	10.2	.0	1.8	6.0	14.5	17.7	12.5
12 months old	50.7	53.1	**27.8**	**51.8***	60.0	54.0	56.4	53.1
13 to 15 months old	37.8	36.2	66.7	46.4	32.0	31.6	25.8	32.8
16 months old or older	2.0	.5	5.6	.0	2.0	.0	.0	1.6
Average age	12.8	12.5	**13.6**	**12.6****	12.7	12.4	12.4	12.4
Sample size	148	196	36	56	50	76	62	64
2-year-old assessment								
Percentage of children who were:								
23 months old or younger	6.5	8.3	.0	.0	25.0	17.6	2.0	9.1
24 months	37.0	43.3	5.9	21.7	4.2	17.6	74.0	67.5
25 to 27 months	43.5	40.1	67.6	56.5	50.0	58.8	24.0	22.1
28 months old or older	13.0	8.3	26.5	21.7	20.8	5.9	.0	1.3
Average age	25.5	25.1	26.8	26.3	25.7	25.3	24.5	24.3
Sample size	108	157	34	46	24	34	50	77

[1] Children were the indicated age plus or minus 2 weeks; e.g., the percentage of children indicated as 12 months old included children within 2 weeks of their first birthday.

samples are small and attaining statistical significance for differences is difficult, or when samples for different populations differ markedly in size, making it difficult to compare the statistical significance of relationships between the groups.

The standards for evaluating whether an effect is meaningful differ depending on the form of the variable being measured. For dichotomous variables (e.g., whether the child was fully immunized), an effect size of .2 to .49 is considered a small effect, an effect size of .50 to .99 is a moderate effect, and an effect size of 1.0 or more is a large effect. An effect size smaller than .2 is not considered a meaningful difference. For variables that are ordinal or continuous (e.g., the parent knowledge scale score, the DPII scale scores), an effect size of .1 to .29 is considered a small effect, .3 to .49 is a moderate effect, and .5 or more is a large effect. An effect size smaller than .1 and not considered a meaningful difference.

In addition to effect sizes, we also indicate the extent to which differences between the participant and the control group were statistically significant. This indicates the likelihood that the difference between the groups would be found by chance. The level of statistical significance is indicated by probability values. For example, the notation $p<.05$ indicates that the difference being described would happen by chance fewer than 5 times out of 100; a difference that is significant at $p<.01$ would happen by chance less often than one time in 100. Larger differences have greater statistical significance and, thus, a lower likelihood that they would be found by chance. A probability of $<.05$ is the commonly accepted standard for placing confidence in statistical findings. However, even at that level, some differences noted between an intervention and the control group could be spurious, particularly when a large number of comparisons are being made. Therefore, in interpreting findings, the greatest confidence should be placed in consistent patterns of findings, rather than in single differences that are not reinforced by the data when they are considered more broadly. Also, statistical significance is influenced greatly by sample size, so that the same size difference between the participant and control group could be statistically significant for a larger sample (e.g., the full sample or Latina mothers) but not for a smaller sample (e.g., non-Latina mothers).

Correlations also are occasionally reported. These show the strength of a relationship between two variables, that is, the extent to which a change in one factor is associated with a change in another factor in a particular direction. Statistical significance also is indicated for correlations.

Multivariate Analysis

Multivariate analysis approaches were used to control for differences between the participant and control groups that are potentially related to their outcomes. In the majority of cases, the outcome variables were ordinal or continuous (e.g. DPII differential score) and we used ordinary least squares regression analysis. This technique enables one to determine the effect of the treatment variable on the outcome while holding constant other factors that are entered into the model as control variables. The regression coefficient for the independent variable indicates the magnitude of change in the dependent variable that would be obtained for an increase of one unit of the independent variable. In testing the impact of PAT participation, several forms of the treatment variable were used. The first was a dichotomous variable representing participants

versus controls, used in Chapters 4 and 5. Therefore the coefficient is the difference in the outcome measure between the participant and control groups that can be attributed to PAT participation, independent of any differences between the groups on other variables that are included in the model. Another form of the intervention that was tested involved program variations, such as the number of home visits families received (with control group members receiving no home visits). In this form of analyses, the coefficient is the change in the outcome variable that can be attributed to each home visit received by a family.

In a few cases, the outcome variables were dichotomous (e.g., fully immunized versus not fully immunized). Logistic regression is the appropriate multivariate analytic technique for these cases. This technique enables one to determine the odds, or likelihood, of a positive outcome occurring for each increment of change in an independent variable while holding other factors constant. For example, we may find that participants are 1.5 times as likely to be fully immunized as controls, independent of other differences between them.